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PEDIATRICS

VOL. XV. JANUARY 1903 No. 1

ORIGINAL ARTICLES.

A CASE OF ACUTE OSTEOMYELITIS, WITH REMARKS ON THE SURGICAL TREATMENT OF THIS AFFECTION.

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In May, 1901, I saw in consultation a boy nine years of age, who two weeks before had been taken sick with chills and pain in the right leg, the cause of which was unknown as the child had been perfectly well previous to the development of the sickness. The temperature rapidly reached 40° C., while the pulse was rapid and filiform, and the general condition had become one of profound sepsis. The tongue was dry and brown, and the features were drawn.

The lower half of the right leg was considerably swollen and there was a collection of fluid in the ankle joint. The pain was extremely intense on pressure, and deep fluctuation could be easily detected. Diagnosis of acute osteomyelitis was made and an immediate operation was advised.

After etherization a long incision was carried over the anterior aspect of the tibia and a large periosteal abscess was opened. On exploring the medullary canal it was found filled with pus and it was decided to resect the lower half of the diaphysis of the tibia, leaving the periosteum intact. The epiphysis was resected. The wound was plugged with iodoform gauze and an extension apparatus applied.

On the next day the temperature had nearly reached normal and the pulse was only 90. The appetite was good and the patient slept well as he had been afforded relief from pain. The dressings were changed daily and in a fortnight after the operation bony regeneration was very marked. In one month's time the wound had closed and the regeneration of the bone had been so rapid and complete that in nine weeks the tibia appeared to be perfectly solid, although in circumference much smaller than its fellow.

The limb was then put up in a plaster dressing and the patient allowed to go about on crutches.

Examination three months after the operation showed that there was about two centimeters of shortening on the diseased side, the tibia was perfectly solid and the patient was allowed to use his limb from this time on. Seen nine months after the operation the boy was found to be in perfect health, and with a leg to all appearances normal and quite as strong as its fellow.

Trephining the bone in cases of moderately severe acute osteomyelitis is the proper treatment to select, but when the disease takes on an excessively malignant aspect, resection of the diseased bone or amputation of the limb will have to be resorted to. Immediate resection of the diseased bone must be resorted to in the acute cases where there is complete detachment of the periosteum from the entire bone, in acute osteomyelitis of the bones of the skull, in cases of hyperostosis accompanied by suppuration and necrosis arising from a chronic osteomyelitis, and in those cases of neuralgic osteitis, when after trephining the bone the pain still remains acute.

Early resection should be performed in all cases of osteomyelitis where trephining the bone and curettement of the abscess have proved insufficient.

Late resection is indicated where there are invaginated sequestra in the newly formed layers of bone, and which jeopardize the patient's life on account of the prolonged suppuration which has been kept up by their presence.

Amputation or disarticulation should only be resorted to exceptionally, in those cases where there is a complete pathologic change in the bone accompanied by a destruction of the periosteum, and a more or less complete necrobiotic change in the neighboring soft parts. In distinctly purulent arthritis accompanying osteomyelitis, with infiltration of the bony tissues entering into the formation of the joint, resection is indicated. Generally speaking the prognosis of resection in these cases is good. The age of the patient, the bone involved and the extent of the resection, the condition of the periosteum and the condition of the epiphysis must all be taken into consideration.

Since subperiosteal resections are based on the physiological properties of the periosteum, a special technic is essential in order to obtain the acquired end, which simply means that the periosteal layer must be preserved in resections of the diaphysis, while the periosteal capsular canal must not be encroached upon in resection of the joint. Resection is especially indicated in childhood and adolescence, because during this time of life the osteogenic properties of the periosteum are marked, but nevertheless, in certain cases it has been practiced successfully in the adult.

871 Beacon St.

CONCERNING ANTIPYRESIS IN CHILDREN.

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The controversy concerning the salutary effect of fevers in the infectious diseases is by no means conclusively ended, but the principle that high temperature must be regulated and controlled is based on substantial clinical grounds, and must be strictly observed in actual practice.

I need scarcely remind you of the great susceptibility of children to causes which produce febrile movement. Very slight causes will often produce high fever. The changes in the temperature curve are often very abrupt; and again, there is a disposition to continuous fever in diseases which are decidedly remittent or intermittent in the adult. Altogether children bear fever very well, and almost continuous high fever for weeks, without autotoxemia, produces very little change in the organism, outside of the disturbances of nutrition. Children differ greatly in their morbid reaction to high temperatures. Some will be very sick with a temperature of 103° F., while others play about with a temperature of 105° F.

It is, therefore, apparent that the urgency of antipyresis depends on the concomitant symptoms, and not on the height of the mercury alone.

It is very questionable whether even moderate temperatures in comparatively mild diseases should be entirely disregarded, if there is evidence of suffering. The parents demand relief, even if no especial effect is produced on the course of the disease by the use of antipyretics. Hence it is the universal practice to administer an antipyretic in all febrile affections. These may be denounced as harmful, but their use continues.

Of the various antipyretic measures, hydrotherapy certainly takes the first place; but the physician who uses this means to the exclusion of others will find himself seriously handicapped. The physician who has a variety of means at hand and can use them efficiently, will accomplish the best results. The tendency of the disease, the condition of the patient, and the effect of the remedial agents, must be considered in prescribing a certain treatment. In many cases it is decidedly advantageous to combine internal and external antipyretics. This is especially true in hyperpyrexia. When the temperature is above 105° F., absorption from the alimentary canal is uncertain, and even when drugs enter the circulation their effect is inhibited. In these cases it is well to precede the exhibition of the drug by hydrotherapeutic measures.

This combined method is not sufficiently employed. Some practitioners rely entirely on the administration of antipyretic drugs, while others rigidly hold to the practice of hydriatrics. If the temperature is in the neighborhood of 105° F. the bath should be used until the fever falls several degrees, then an internal antipyretic will exert its physiological effect and maintain the reduction. By using the bath first for some time it is rarely necessary to give heroic doses of the antipyretic drug; moderate doses accomplish our object, and danger of cardiac depression is obviated.

The use of the coal-tar antipyretics is regarded as dangerous, and yet they may be used with safety in many cases, and their analgesic effect gives them an unique position in the treatment of fevers.

In the use of the coal-tar products, it must always be remembered that they depress the activity of those vital processes by which infections are conquered. They should be used very sparingly when there are indications that the patient will need all his vitality to overcome a prolonged bacterial invasion. Their use is also contraindicated in all diseases in which the heart is liable to fail—such as diphtheria and pneumonia.

In the early stages of scarlet fever and the other exanthemata, they are not harmful, and the relief that they afford will generally justify their use. In influenza they are generally indicated for the relief of pain, although some cardiac stimulant should be combined with them. I have found the combination of phenacetin and camphor advantageous. Camphor is a heart stimulant and also nerve sedative; it is also a mild antipyretic, according to Lauder Brunton.

Let me also call attention to the value of pilocarpine as an eliminant and antipyretic in diphtheria and scarlet fever. The salivation produced by this drug is invaluable in preventing toxic lesions, and allows the organism full power to eradicate the disease. When the fever is very high, hydrotherapeutic measures should precede each dose of the drug. I have, for many years, depended largely on pilocarpin and the bath in the treatment of scarlet fever. In diphtheria, as an adjuvant to antitoxin, pilocarpine is almost indispensable; it removes toxin, while antitoxin neutralizes it.

In pneumonia, veratrum viride is the safest antipyretic. It relieves the pain and lowers the temperature, particularly when aided by hydrotherapy, quiets the nervous system and prevents excessive pulmonary engorgement. Its general neglect is undeserved, and authorities who condemn its use are those who have had little or no experience with it. Of course, it should be given under careful supervision, its effect must be closely watched, and when the physiological effect is produced the dose must be reduced or its administration discontinued. Veratrum is one of the best remedies for the relief of headache in the first week of typhoid fever.

Another valuable antipyretic is the external application of guaiacol. DaCosta, in 1884, first proposed this remedy for the reduction of temperature in typhoid fever. He recommended that not more than thirty drops be painted on the abdomen. In a very short time the temperature drops, and profuse sweating ensues. By other clinicians its use has been extended to the treatment of other diseases, particularly tuberculosis and pneumonia. In fact, the lamented Moncorvo proved that the external application of guaiacol can be used as a diagnostic aid to differentiate tuberculosis from malaria, since there is prompt reduction of temperature in the former disease, while in the latter the fever is unaffected.

Just how guaiacol acts in reducing fever is still unsettled. Carter declared that it must act reflexly from its peculiar action on the peripheral nerves. He bases his claim on the ground that the effect is too prompt to allow of effect from absorption. In fact, he could not determine its presence in the urine when the drug was not inhaled.

But to the clinician who watches the fall in the fever and sees the effect on the sudoriferous glands this explanation seems almost ridiculous. The drug must be absorbed, and its different action on the skin and gastroenteric route can be explained in the fact that in the former the liver is circumvented. When given by the mouth it is retained or neutralized in the liver, while it passes

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directly into the circulation when applied to the skin, and can thus act on the central nervous system.

I have found this method exceedingly valuable as an antipyretic in infants and children. When the stomach is very irritable, and hydrotherapy inapplicable for any reason, the external application of this drug acts well. In pneumonia, particularly, many infants do not bear cold baths well, and here this method is indicated. In typhoid fever, and especially in tuberculosis, there should be no hesitation in applying guaiacol, if the temperature and other symptoms demand its use. With care there is little danger of depression. The susceptibility of infants to this remedy varies greatly; in some, one drop, applied externally, will produce the desired result, in others several drops must be used.

Hydrotherapy is now generally employed, but its practical application demands a knowledge of its principles and also a correct appreciation of a varied technic. The water must be applied differently in different cases. Some children can take the full bath very nicely, others become very chilly and do not react promptly. For general use the wet pack is the most likely to agree.

ON AMAUROTIC FAMILY IDIOCY.

A DISEASE CHIEFLY OF THE GRAY MATTER OF THE CENTRAL NERVOUS SYSTEM.[1]

By B. Sachs, M.D.,

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The clinical symptoms of amaurotic family idiocy have been described frequently and thoroughly enough. It is gratifying to note that the clinical picture as developed by the present writer a number of years ago has been generally accepted, and has been fully endorsed in the excellent articles by Hirsch, Peterson, Mohr, Patrick, Falkenheim, and a number of others. Two symptoms, in addition to those originally given, have been mentioned by Falkenheim:—"Explosive laughter" and "disturbance of deglutition." The former I have not observed, though I do not doubt its occurrence in some instances, and the latter may be taken to be either an accompaniment of the great mental and physical deterioration, or it may, at times, have the value of a "bulbar" symptom; and "bulbar" symptoms are explained easily enough, in view of our present knowledge of the morbid anatomy of the disease.

While the disease is relatively rare, the records have become so numerous that Falkenheim has been able to analyze 64 cases.* The number is increasing rapidly and mere statistical studies will soon not be needed. I would urge, however, that the clinical type as now accepted, be not disturbed because of any unusual symptoms, such as were recorded, for instance, in the cases of Claiborne, Kuh and De Bruyn. The last named author has, of his own accord, and justly so, withdrawn his case from this especial type. In the case of Claiborne the condition was complicated by a tubercle of the corpora quadrigemina, and although the characteristic change in the fundus was made out, the patient presented so many unusual features that this record should be utilized, if at all, with

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[1] Read at the annual meeting of the American Neurological Association, June 5, 6, and 7, 1902.

*I have another case under observation at the present time.

(By Courtesy of *Journal of Nervous and Mental Disease.*)

great caution. In Kuh's case the clinical picture was obscured and altered by the presence of an hydrocephalus.

The chief interest in the study of amaurotic family idiocy has been shifted from the clinical to the anatomical side. There is, in the main, a fortunate agreement as to the findings. There can be a difference of opinion only with respect to the interpretation to be put upon these findings. Nine years have elapsed since I have had the opportunity of studying carefully the morbid changes in a case that had been under my own observation. Since that time so many new staining methods have been introduced that I was eager to undertake this special study in pathology again, and to determine to what extent conclusions of former years would have to be changed or reinforced. For the opportunity of studying the present case I am greatly indebted to Dr. Sarah Welt, who devoted an unusual amount of time and patience to the care of this child before finally referring it to Mt. Sinai Hospital; and I am also indebted to Dr. Koplik, who, knowing my interest in the subject, was good enough to put this child entirely under my charge. As in all the other cases, the history of this one may be stated briefly:

This child, C. S., born of Hebrew parents, was two years and seven months of age at the time I first saw it at the hospital, in September, 1901. The patient's mother had had three children. The first-born is now six years of age, a fine, healthy-looking child. The second child died at the age of sixteen months. Two months before its death the mother knew that it was blind. It could never sit up straight; never uttered a sound; had no spasms, but was feverish off and on. It was thought to have tubercular meningitis, but in all probability was afflicted with this family disease. Our own patient, the third child, was born about two and one-half years after the second. During pregnancy the mother was nervous, but otherwise well; labor was normal and short. At birth and for some time afterward the child appeared to be normal; it vomited a great deal, however, and as time passed on it was noticed that it could not sit up straight, nor did it seem to be as bright as other children. The mother thought that the child recognized her when it was somewhere between six and ten months of age, but after this period the vision gradually grew fainter and fainter. At the age of one year the child was practically blind, and since then the general weakness increased. At about this time the typical changes in the region of the macula lutea were made out. At the age of nineteen months it had a vomiting spell with convulsions. In November, 1900, it was afflicted with pneumonia, from which it recovered, but the mother states that thereafter it never moved its extremities except in convulsions. The extreme contractures in the upper and lower extremities which the child presented were developed about February, 1901. The statement was made that these came on quite suddenly after a convulsion, but of this fact we cannot be entirely certain. The child had difficulty in swallowing and was startled by the slightest noise. With the exception of increasing emaciation, the condition remained practically unchanged up to the time of death, on October 16, 1901.

The history as given above is largely based upon the careful observation of Dr. Sarah Welt, and the condition was also carefully studied by me during the four weeks preceding death. In the last two weeks of life the temperatures were often subnormal. To complete the history of the case, it may be added that the mother nursed this child to the age of eleven months. She had nursed the second child to the age of eight months, while the first healthy child was raised on sterilized milk.[2] While carrying the amaurotic child, the mother felt very little life, and in passing it may be noted that she was distinctly of cachectic build. From the above account of the child's condition it will readily be seen that the diagnosis of amaurotic family idiocy could be made with absolute certainty.

The autopsy was performed ten hours after death, on October 16, 1901, by Dr. Libman, Assistant Pathologist of Mt. Sinai Hospital. To him and to his chief, Dr. Mandelbaum, I am indebted for a full report. We could not get permission to remove the eyes, but with this one exception the study is complete.

Upon removal from the skull the brain weighed 784 grammes; the dura mater was rather firmly adherent to the bones. The cortex was so firm that the knife grated as it passed through it—a sound which I have not heard under similar conditions since the autopsy on the first subject of this disease. It was noted that the convolutions were small and that there were fissural peculiarities,—indications of a low type of brain, such as I recorded in the very first report made upon this disease, but such changes have not been referred to in the reports of others. In view of the possible developmental character of the disease these structural peculiarities are of some importance. The fluid in the pia was markedly increased in amount. The pituitary body was not enlarged.

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[2] I make mention of these facts in order to do justice to Hirsch's theory. The facts would seem to support his theory, but for reasons to be given later on I cannot accept the same.

Of other changes noted at the time I will only refer to an old pleurisy, and to a very advanced parenchymatous myocarditis.

The brain and spinal cord were at once put in formalin and prepared for staining by the various methods now in use. Serial sections have been laid through almost every part of the entire central nervous system. A careful study of these sections shows some deficiency in the development of the cerebral white fibers and also a degeneration of the pyramidal tracts in the lateral as well as in the anterior columns of the cord. This same degeneration can be traced through the course of the pyramidal tracts in the internal

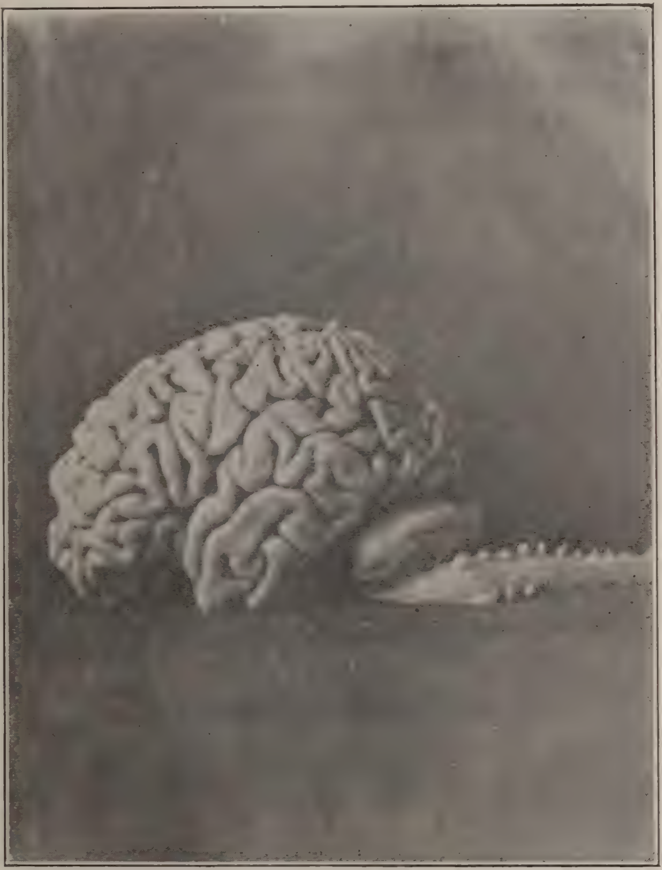

Fig. 1

capsule, crusta, pons and medulla, but much more striking than this change in the white fibers is the change in the gray matter of the central nervous system. The changes are found to be the same in the cortex of the brain, in the cranial nerve nuclei, in the anterior and posterior gray matter from the cervical to the lowest lumbar, and sacral segments of the cord. Even the sacral ganglia show similar changes. The changes are practically those to which attention was explicitly directed by Dr. Hirsch, and which were found to be similar to those reported by me in the cortex in 1887, and were also found on a reëxamination to be contained in some of the spinal sections of the specimens examined in 1892 from my second case.

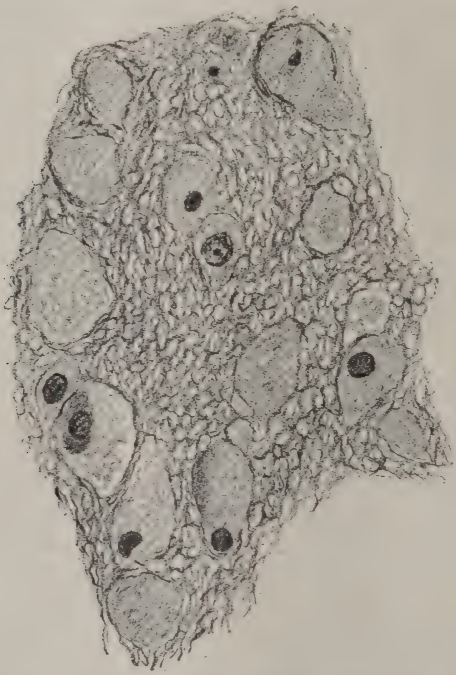

Fig. 2—Section through cortex, showing changed pyramidal cells. Hematoxylin-eosin stain. Oc. 4; obj. 1-12 (Leitz).

Of course these changes are brought out much more beautifully by the Nissl and other methods now in use. There is unquestionably some increase of the neuroglia cells throughout the central nervous system, but the chief and most remarkable changes are found in the larger ganglion cells throughout the entire extent of the central nervous axis. In the cortex as well as in the anterior gray matter of the cord there is not a normal ganglion cell to be seen. As will be noted in the specimens and illustrations herewith presented the cell body is completely altered, the entire cell protoplasm has become disintegrated, leaving a more or less homogeneous mass, the nucleus has been shifted commonly to some part of the periphery of the cell, and instead of being distinctly differentiated from the rest of the cell-body it generally shades off by degrees into this aforesaid homogeneous mass. The nucleus is often wanting entirely, and, in some instances, the entire nucleus appears to have dropped out. The disintegration of the cell-body is so complete that in many specimens the contour alone enables one to infer that these round bodies are the remnants of ganglion cells. These metamorphosed ganglion cells are frequently surrounded by distinct pericellular spaces and are relatively and ab-

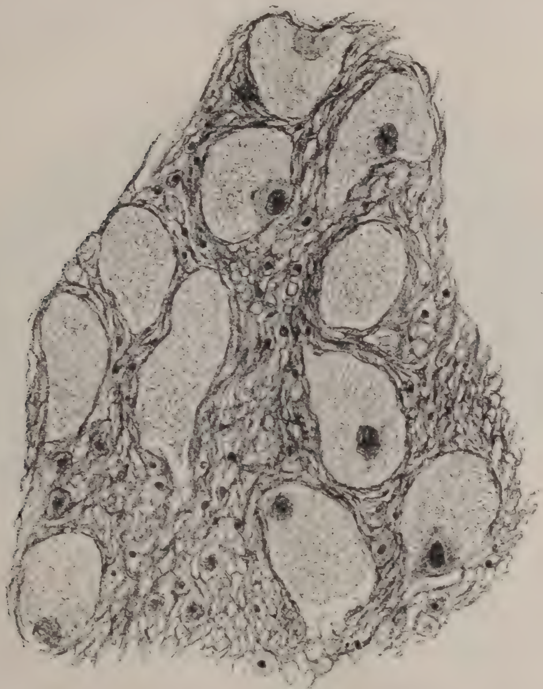

Fig. 3—Section through XII nucleus in medulla oblongata showing advanced changes in ganglion cells. Hematoxylin-eosin stain.

solutely so much enlarged that they give a very striking appearance to the cross section.

There is no doubt an entire agreement between the findings in this last case of mine and those so well reported by Dr. Hirsch before this Association a number of years ago. Curiously enough, other recent writers have not been struck by these changes in the gray matter of the brain and spinal cord. In a recent and preliminary report by Prof. Schaffer of Buda-Pest there is the account of a typical case and in the report of the post-mortem findings special stress is laid upon changes of the white fibers and nothing is said about the gray matter, except that it is entirely normal, and yet, from the cut (Fig. 2) which accompanies his article, although it is reproduced at a low power, I suspect that these same large cell-bodies are present, such as Hirsch and myself have found and described.

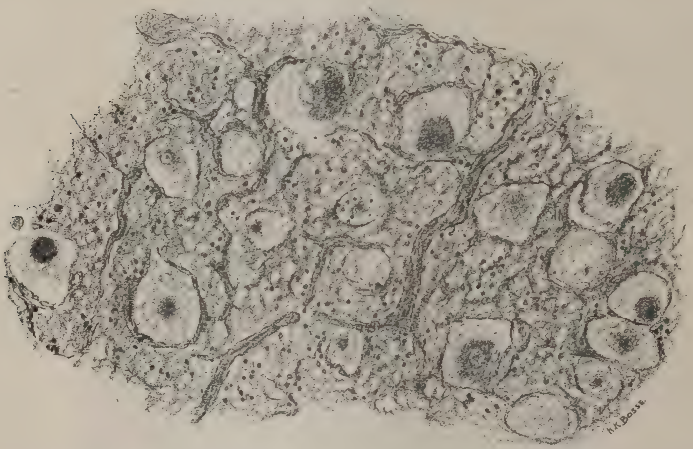

Fig. 4—Section through cervical enlargement showing cell changes in anterior gray matter. (Van Gieson stain.)

The chief inference to be drawn from a study of sections laid through every part of the central nervous system in this and in other cases of amaurotic family idiocy is that the morbid process in this disease affects primarily, or at least to a great extent, the entire gray matter of the brain and of the spinal cord. The degeneration of the white fibers of the anterior and lateral pyramidal tracts is in all probability secondary, but not nearly so great or so marked as one would expect with such advanced disease of the ganglionic tissue. It is already probable that the relative involvement of the gray and white matter may vary in different subjects of this disease.

The neurone theory has received so many severe blows of late that the somewhat anomalous condition of affairs as observed in this case need not be especially dilated upon. The theory may have to go to the wall in part or as a whole, but the facts will stand and will call for further elucidation.

In 1887 I spoke of these changes as representing an agenetic condition pure and simple affecting the highest cortical nerve elements. At that time I was not aware of the widespread character of the morbid process. Later researches, and particularly those of Kingdon and Russell and of Hirsch, have laid stress upon the degenerative character of the disease. Much has been made of the fact that the present author has recorded the process as essentially an arrest of development, while the other writers just mentioned have insisted upon the purely degenerative and acquired character of the disease. Some writers have accepted these expressions of opinion as though they indicated a widely differing conception of

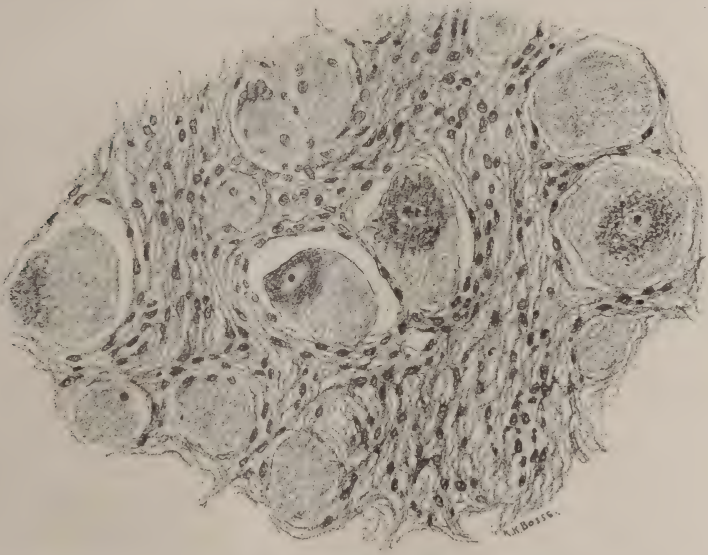

Fig. 5—Section through a lumbar ganglion. Nissl stain showing marked cell changes.

amaurotic family idiocy, but the difference between the views of the authors just mentioned and of myself is not so great as it would appear at first sight.

A degenerative process does not necessarily represent an acquired or an acute affection. It is my contention now, as in former years, that degeneration will set in whenever normal growth is arrested, but life continues. A child to be afflicted with amaurotic family idiocy is born with a limited and restricted capacity for normal development. Its gray cells may do as well as those of any other child up to the age of two or three or six months, but beyond that its powers for further development will not go. To this extent, in this respect, the disease is after all a congenital affair; when normal development ceases, degeneration sets in.

Gowers has recently written a very helpful article in which he applies a similar course of reasoning to the various scleroses, and has suggested the term "abiotrophy," which I gladly accept, to indicate this arrest of normal development followed by degeneration. The various parts of the nervous system, according to Gowers, have their own vitality. "Some of them may slowly die, while the life of all the rest goes on without impairment. * * * When the failure is early it is due only to a defect which seems to be inherent, the tendency thereto inborn. We do not indeed apply the word 'death' to this slow decay of the elements; we speak of it as 'degeneration'; but the process is in many cases—perhaps in most—an essential failure of vitality." The term "abiotrophy" designates a lack of vital nutrition, while the term "abiotic" would designate that which depends on defective vitality. Were we to adopt Gowers' phraseology, we might with good reason claim that amaurotic family idiocy is due chiefly to a defective vitality of the gray matter of the central nervous system.

To my mind there is an almost insuperable objection to the doctrine that so distinct a family affection is an acquired disease; yet granting the possibility of this it could only be conceivable upon the further theory of toxic or other influences acting upon the tissues of deficient embryonal potentiality. Hirsch's contention that the toxic influence may have been exerted through the mother's milk cannot be maintained for the simple reason that several of my patients have not been nursed by the mother. Assuming that amaurotic family idiocy may be an acquired disease, the toxic nature of the degenerative process has been argued from the resemblance of the cell pictures to those found in cases of poisonings of various kinds. This point deserves careful consideration, but cannot be decided unless we are certain that the cell changes as we see them represent definite changes due to definite causes.

With the refined staining methods of the day, we have learned much regarding the protoplasmic changes of the cell-body. But I ask, does acute poisoning produce cell changes distinctly different from those of chronic poisoning? Again, can we make out from inspection of the cells whether death was due to metallic poisoning, to acute infectious disease, to a condition of marasmus or what not? For the present it would be hazardous to present such a claim.

It would seem more profitable to attempt to discover other conditions in which cell changes occurred somewhat similar to those made out by Hirsch and myself.

Dr. Spiller reported the case of a boy about nine years of age, the inmate of the Pennsylvania Training School for Feeble-minded Children, who was in all probability afflicted with congenital spastic rigidity and imbecility. This child was seized with symptoms resembling those of cerebro-spinal meningitis from which he died five days after the onset. The microscopical examination of the nervous tissue, Spiller writes, showed little evidence of inflammation.

"I found cell changes in all the cell-bodies of the posterior and anterior horns of the spinal cord; in the nuclei of the cranial nerves; in the sensory as well as the motor nucleus of the fifth nerve; in the cells of Purkinje and in the parietal lobule where especially the cells of Betz were altered. These cell changes were very like those found in amaurotic family idiocy. The gross lesions of meningitis were not found." Spiller seems to interpret these cell changes to be the result of the acute process. I am tempted to question him whether they might not more properly be related to the "chronic spastic rigidity and imbecility." Are we certain enough of these cell changes to claim that they must necessarily be the product of some acute intoxication?

The findings of Rolly in a case of Little's disease (congenital spastic diplegia) are of special interest in this connection. The child was the second of twins, born in the mother's fourteenth confinement. The child was born asphyxiated, and presented all the symptoms of marked spastic rigidity (diplegia), with frequent convulsions. These symptoms continued without much change until death, at the age of about two and one-half months. Rolly lays stress on the specific history of the father, and wishes chiefly to prove the bearing of syphilis upon the etiology of Little's disease. For my present purposes I am interested in his cell findings, Nissl himself having examined Rolly's specimens taken from the spinal cord and from the brain. In the lumbar portion of the cord the author states: "Side by side with cells which present a tolerably normal appearance are others which exhibit a granular disintegration of the Nissl bodies surrounding the nucleus, while the peripheral portions of the cell body remain practically normal." Similar changes were found in the dorsal portion of the cord. In the cervical portion "there are fewer normal cells than in the other divisions of the cord. As a rule, the nucleus cannot be distinctly differentiated from the cell protoplasm. More marked still are the degenerative changes in the brain. There is an enormous and diffuse proliferation of the neuroglia. Some ganglion cells have lost their contours and are more or less shapeless masses, which shade off into the surrounding tissue. Some ganglion cells are so thoroughly disintegrated that one sees practically only lacunæ, which, by their shape, remind one of the ganglion cell form. Small vacuoles were also seen to be present in some of the ganglion cells." All of these changes bear the closest resemblance to the findings in amaurotic family idiocy. Had this child lived to the age of the amaurotic children previously described, the change would no doubt have been still more striking.

I would also call attention to similar findings in the cases of "generalized rigidity" as described by Collier,[3] and in a somewhat similar case reported by Mya and Levi. Whether these latter cases are described as spastic diplegias or as cases of "spastic pseudobulbar paralysis," according to Peritz, the point that is of special interest to us is that very similar anatomical changes have been found in the brains of children who had been afflicted with varying forms of cerebral disease.

Peritz is inclined to the opinion that I have made a special effort to establish amaurotic family idiocy as an entirely independent disease. In this he is mistaken, for I have contended for nothing more than that this family disease represents a distinct and easily recognizable clinical type. This is evident from the fact that in this city not only neurologists, but pediatrists and general practitioners have learned to diagnosticate amaurotic family idiocy with surprising ease on clinical grounds. The disease can be differentiated easily from the other forms of idiocy and from the various types of infantile cerebral palsies. In his earliest publications on this subject the present writer endeavored to show the relationship between amaurotic family idiocy and other congenital cerebral conditions, but he considered it necessary to proceed cautiously before arriving at any definite conclusion. At the present time, however, in view of the researches of Hirsch, Rolly, Spiller, Collier, Peritz, Sachs and others, it may definitely be stated that there is a close anatomical relationship between amaurotic family idiocy and other cerebral diseases of childhood which are dependent on an arrest of, or at least a disturbance in, the normal development of the central nervous system.

I will not as yet claim that the morbid process in all of these children is identical, but it seems to me that the only just inference to be drawn is this, that in amaurotic family idiocy the entire central gray matter is the seat of an intense degeneration, and that somewhat similar changes are found in conditions more or less closely allied to this special type of family disease. But even if closely allied to other affections, the clinical picture of the type is so distinct that we can well afford to consider it a special clinical form of family disease. Why children of one race should be afflicted so much more often than those of others, when the allied conditions show no such preference, remains as great a puzzle as ever.

We have not yet reached the end of this discussion, and I trust that with every new case carefully reported and carefully studied further light will be thrown upon a disease that appears to me to be of increasingly greater interest. Above all things, I would have future writers on this subject pay the closest attention to the changes in the gray matter of the brain and of the spinal cord.

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ON CONSTIPATION

By Professor H. Surmont, M.D.

The word constipation is one that appears to hardly need definition, it is in such common use; nevertheless, from the medical standpoint, it is as well to understand exactly the precise meaning that should be attached to it. Of all the definitions that have been proposed from time to time, that which I think ought to be adopted as being at the same time the most explicit and the most exact, is that of Soupault, as follows: "Constipation is the retention and accumulation of fecal matters in the large intestine, no matter in what form they are passed."

Those who, from reasons purely physiological, have infrequent and small stools must be regarded as suffering from false constipation; for example, those who voluntarily and habitually limit in a marked degree the amount of their food, and consequently the alimentary residue; hence evacuations rare and small, but without retention or accumulation in the large intestine. This condition is not uncommonly met with in coquettish and neurotic young girls.

Some people, during the whole of their lives, or for many years, evacuate less frequently than normal—every two or three days for instance—without suffering any inconvenience. Should this condition be considered pathological, since it is generally admitted that in the normal state there should be at least one motion a day? This is not the opinion of Potain and Nothangel, who hold only those to be constipated who suffer undoubtedly from the rarity of their evacuations. This opinion cannot be accepted without reserve, in my opinion, for the physician in certain cases can attribute a considerable pathogenetic value to a constipation from which the patient does not suffer at all, since as a rule a large number of constipated people experience no trouble for a longer or shorter time; the mechanical reflex or toxic troubles of constipation appear but slowly with them. The frontier between what may be called physiological and pathological constipation is evidently a matter that must be decided on the merits of each particular case.

*Specially translated from *L'Echo Medical DuNord.*

The second part of Soupault's definition states that the conception of constipation is independent of the appearance of the evacuated fecal matter. This, from the medical point of view, is the very thing that it is most essential to emphasize; for every patient and many doctors think that constipation is essentially characterized by the passage of hard matter; but, leaving aside false constipation, of which we will speak presently, there exists a large number of people who are *constipated without knowing it.* These may be classified in three categories—those whose stools are normal in appearance; a larger number who suffer from diarrhea and constipation alternately; and finally those whose stools are always liquid.

Patients of the first category, if the abdomen is examined, present evident signs of fecal obstruction. Still they pass stools of normal appearance; the fact is that the intestine is full, and they evacuate the excess by overflow in exactly the same way as persons with retention of urine get false incontinence and the urine dribbles away by overflow. It is possible in these cases that a sort of canal forms in the center of the fecal mass and permits the surplus matter to be evacuated a little at a time.

Patients of the second class are much more numerous; the majority of them complain, not of constipation, but of diarrhea; a few questions will elicit the fact that the attacks of diarrhea are separated by periods of constipation; with them constipation is the initial fact; the hard fecal matter produces local irritation; this causes intestinal hypersecretion followed by profuse evacuation, in the midst of which will be found hard lumps, the origin of all the trouble.

In the third class the stools are always liquid. With them the intestinal hypersecretion is continued, not paroxysmal, as with the preceding, but an examination of the stools will show characteristic scybalæ in the midst of the liquid. Simple as this appears, it is still necessary to distinguish between obvious constipation, false constipation, and those who are constipated without knowing it; this is the more necessary, because in general practice constipation is as a rule not the symptom for which the doctor is consulted, at any rate amongst the well-to-do.

To have an exact idea of its meaning, and to add to this the exact etiology in each particular case, is the more important, inasmuch as constipation is by no means easy to cure, and a large number of those suffering from it are greatly disturbed at their condition, and that it is necessary to relieve them to prevent their having recourse to practices that are empirical, dangerous, or ridiculous, and to prevent them becoming the prey of quacks.

From the standpoint of etiology and of symptomatology, as well as of therapeutics, two forms of constipation must be distinguished, according as it is temporary or accidental, or on the contrary, habitual.

Temporary or accidental constipation has two kinds of causes. It may be due either to temporary modifications of the ordinary rules of general hygiene or of diet, or it may be caused by a pathological condition of which it is only a symptom.

Constipation of the first kind is common; it requires attention, for it seems to point to a certain weakness of the intestine, or to a diminution of the sensibility of the rectum which is in reality a predisposition to habitual constipation. Thus you will hear persons complain that some simple disturbance(a railway journey or a carriage drive), extra physical fatigue, some new physical exercise (the bicycle or riding), upsets the functions of their intestines.

Again, you will meet patients extremely susceptible to astringent articles of diet or to hot drinks, particularly tea, and certain fermented drinks—red wine, for example. It is necessary to know the existence of these manifold influences, apparently so insignificant, to point them out and warn people against them, which is usually sufficient to prevent relapses.

Temporary constipation may also be pathological. It has a place amongst the symptoms of many diseases, whether chronic, or acute and febrile, which it is not necessary to pass in view here. It will be your part in such cases either to let alone, or to check this symptomatic constipation, according as it is beneficial or dangerous. Thus you would be very careful not to provoke an evacuation of the intestine, when called to a peritonitis, for fear that the contractions of the walls of the intestine would cause the spread of the septic exudation; on the contrary, it is of the greatest advantage to an enteric to eliminate at the same time both fecal matter and the enormous quantity of toxic products that it contains.

This paper must be particularly devoted to habitual constipation. Lasegue has pointed out that there is reason, according to the symptomatology, to distinguish between two types, according to whether it is total or partial.

It is called *total* when the evacuations are at the same time infrequent, abundant, and when the matter consists of hard material. It is called *partial* when the disturbances of the functions of the intestine are concerned only with either the frequency, or the quantity, or the quality of the evacuations. One form of partial constipation is distinguished by the fact that there is a long interval between the stools; in *quantitative* constipation the motions observe their ordinary frequency, but have diminished in quantity; in *qualitative* constipation we find either alone, or in combination with both the other forms, or with one of them, an abnormal appearance of the fecal matter; they may be hard, oval, pigmented, covered with mucus, or with mucous membranes, or accompanied with intestinal sand (muco-membranous enteritis).

In average cases of the first variety there is an interval of three or four days between the motions, but in some cases, especially in hysterical individuals, they are astonishingly rare; in such cases there is always room for suspecting deception, but Lasegue has reported classical cases of hysterical constipation, incontestable, and verified by him, which lasted four and even six weeks.

Mild cases of *quantitative constipation* require a careful examination of the abdomen to discover their existence, but in its extreme degree the amount of matter that may be retained in the intestine reaches proportions that are truly extraordinary. There is a case of Lasegue, quoted by every author, of a man who for six or eight months complained of distension and violent pains in the abdomen, without either vomiting, diarrhea or apparent constipation; one night he had a formidable clearing out, and filled one after another seventeen night stools. Quantitative constipation is very frequent amongst children, particularly in well-to-do families, where they are given too much meat and an insufficient amount of vegetables and fruit. The nervous and general reaction that follows, especially in children of a neurotic tendency, from intestinal reabsorption, gives rise to the gravest alarm on the part of the parents and ill-informed physicians, and the most varied errors of diagnosis arise, as meningitis, typhoid fever, intestinal influenza, *etc.*.

In quantitative constipation, the fecal matter takes the form of hard balls of variable size, sometimes small as the dung of a goat, sometimes larger and oval in shape. When their consistence is very hard, they are called scybalæ; in cases of long standing the scybalæ become as hard as a stone, rebound from the ground, and really deserve, on account of their being covered with an incrustation of carbonate and phosphate of lime, the name of dung-stones. The scybalæ are expelled either separately or in masses, alone or accompanied with mucus, intestinal sand or gravel.

Although some persons may have rare or insufficient evacuations for a long time without any apparent deviation from their normal condition, constipation more usually has an injurious effect upon the general health and the various bodily functions of the individual.

Amongst the symptoms which accompany habitual constipation we may mention loss of appetite; loss of appetite is the rule; it is accompanied sometimes in severe cases by foul breath, which is a source of torment to the patient and to those around him; the tongue is dry, pointed, raspberry; or on the other hand much furred, very large, soft, and marked with the impressions of the teeth. The gastric digestion is generally altered, either through mechanical disturbance due to faulty emptying of the organ, or to vitiation of its secretion, or to both together; all the digestive secretions are also decreased or vitiated. It is easy to convince oneself of this as far as the saliva is concerned; it is either scanty (with red tongue and exaggerated thirst), or thick, viscous, and increased in quantity (with furred tongue and expectoration). After a certain time the liver becomes affected, not only the hepatic cells, which often display a slight degree of insufficiency, but also the biliary secretion, which is often diminished (decoloration of the stools), or partly retained in the obstructed canals; this gives rise to cholemia, which partly explains the peculiar color of the skin in long-standing cases. These troubles lead to a modification of the physical state of the organ and cause an enlargement more or less marked. The urinary secretion is also modified, and an examination of the urine demonstrates an habitual increase of the products that point to intestinal fermentation; indican, allied acid sulphates, urea, chlorine and phosphorus are connected on the one side with the reduced diet; on the other with the alteration in the general nutrition, which is almost always affected, and the nervous system. Constipated persons are usually neurotics. The circulation is habitually disturbed, and after a meal in particular we may observe rushes of heat, cerebral congestion, vasomotor troubles, cardiac palpitations. We have already mentioned the foulness of the breath which, with shortness of breath and dyspnea, sometimes sufficiently alarming, forms a chapter of the respiratory troubles.

The nervous system is nearly always affected, and it may be said that the majority of sufferers are persons whose nervous systems are more or less in an abnormal condition. It would be going too far to say that neurasthenia is the occasional sole cause of constipation, or, inversely, that constipation is the cause of neurasthenia; but you will certainly have occasion to observe that there are frequently close connections between these two morbid states, and it is sometimes difficult to decide which of these two pathological conditions is the earlier.

The mental condition of the costive is often upset. Sometimes they are veritable monomaniacs; usually they are difficult to manage, difficult to treat, and unpleasant for those around them. Has not a diplomatist said that before having an interview with a minister it is well to know the state of his bowels?

The general condition of the costive is generally altered. These patients are usually thin, wanting in energy; they have a yellow tint, their eyes are brilliant, the skin dry and scaly, the hair and beard dry and brittle, their skin is often the seat of various eruptions—prurigo, urticaria, acne, etc.; these characteristics, added to their mental condition and the odor of their breath, their want of appetite, the furred tongue, permit them to be easily recognized, and their exterior aspect is truly characteristic. Besides the preceding symptoms, which form part of the usual picture of constipation, there are others, more uncommon, but also more serious, which may be looked upon as secondary complications, and which may be classified, according to the mechanism that produces them, into mechanical troubles and toxic and reflex disturbances.

The hardened and agglomerated fecal matter lodged in the large intestine causes a local irritation of the intestinal walls. This irritation is betrayed by a number of pathological troubles, of which the most simple is catarrh of the colon or of the rectum, characterized clinically by the presence in the stools of a larger or smaller amount of mucus, quite distinct from the stool.

A degree further, and the disease becomes a muco-membranous enterocolitis, with the expulsion of glairy mucus and false membrane and other typical characteristics. Enterocolitis, with the passage of sand or gravel, is another form of chronic enteritis associated with habitual constipation.

Intestinal ulceration betrays itself by the existence on the surface of the fecal matter of streaks of blood, sometimes even by small hemorrhages. The importance justly bestowed of late years upon appendicitis should not lead us to forget the existence of stercoral typhlitis which Professor Dieulafoy himself has recently laid stress upon, and called the attention of physicians to its existence. As a pendant to stercoral typhlitis, a Swiss physician, Dr. Mayor, of Geneva, has described a sigmoiditis of fecal origin, reproducing in the sigmoid cavity the symptoms of typhlitis.

There are again complications in the pathogenesis of the disease, and amongst these, disturbances of mechanical origin hold the first place; they give rise to the accumulation of enormous masses of fecal matter in the rectal and sigmoid cavities, which form *veritable stercoral tumors,* sometimes so voluminous that they are mistaken for true tumors; they may produce actual obstruction and resist all medical treatment and necessitate curettage of the rectum. When the sigmoid cavity is full of fecal matter, it has, according to many authors, and especially Treves, Portain and Albert Mathieu, a tendency to become twisted upon itself, or to fall down if the mesentery is long enough; in this way a true intestinal occlusion is produced, very difficult to diagnose from obstruction.

Fecal tumors cause compression of the neighboring organs, especially in women, where they lead one erroneously to think of lesions of the uterus and connected parts; in men seminal losses are sometimes observed. Sciatica and neuralgia of the crural nerve are also met with in connection with constipation, sometimes caused solely by compression, but also sometimes due to reflex and toxic influences. It is also necessary to mention hemorrhoids which, though due to phlebitis of the hemorrhoidal veins, as demonstrated by Quenu, are excessively frequent amongst the constipated, and are partly of mechanical origin; also fissure of the anus, caused by tearing of the mucous membrane by the passage of hard or too large scybalæ.

Disturbances arising from auto-infection, the importance of which has been so ably demonstrated during the last twenty years in most of the affections of the digestive canal, are naturally found also in connection with constipation. They are observed at their maximum in children in whom, under the influence of the retention of fecal matter, it is no uncommon thing to see the temperature rise, and grave general phenomena present themselves, which sometimes make the physician think of more serious ailments. Old people are also very susceptible to fecal poisoning, probably on account of the slight resisting power of their systems and their liability to insufficiency of the eliminating organs. In them the symptoms closely resemble those that are associated with a mild form of Bright's disease.

Adults, especially women, resist fecal poisoning much better.

For this poisoning to occur, it is of course necessary for the toxic substances contained in the fecal matter to be absorbed by the vessels and lymphatics of the mucous lining of the intestine. Consequently, when the hardened feces is surrounded by an impermeable coating, the absorption is less to be feared; but it may appear if the matters become liquified either through the intestinal hypersecretion that they tend to produce (false diarrhea), or under the influence of a purgative not strong enough to expel the accumulation at once, but which, leaving it liquid in the intestine, favors the absorption of the toxic products. This is the natural explanation of the fever and the general phenomena which sometimes occur in constipated persons after a purgative that has not given satisfactory results.

Amongst the nervous phenomena that may be considered as reflex, I may specially mention headache, noises in the ears, ordinary migraine, trifacial neuralgia, and, sometimes in children, more serious disturbances as convulsions. It is often difficult in these cases to decide the part in the origin of these affections that should be allotted to stercoremia or to another etiological factor, the importance of which has been much disputed for some years, but which must not be left completely on one side—reflex action. Reflex action of intestinal origin is evident in fact; for example, in the phenomena arising from worms, of which, according to clinical experience, a large part are not of toxic origin; in those that accompany lateral squeezing of the intestine; in the disturbances and colics that in some people follow the introduction of even a simple suppository or even a rectal examination (Leube, quoted by Albert Mathieu, has published the history of a patient who suffered from vertigo after a rectal examination).

Cases of nervous trouble, even of epilepsy, have been published, which were improved or cured by the treatment of the constipation. Indeed, there is one commonly observed fact with respect to which all practitioners are agreed; that is, the absolute necessity of avoiding constipation in patients suffering from nervous diseases (especially epilepsy), or from depressing mental affections, as well as from organic nervous lesions (general paralysis, cerebral arteritis) and from hepatic or renal insufficiency.

The diagnosis of constipation is, as a rule, extremely simple; it is usually made by the patient himself, but it should be verified by the physician, since, as we have mentioned, there is such a thing as *false constipation.*

A careful examination of the patient and of the characters of the motions will be sufficient to enable us to distinguish those who are constipated *without knowing it.*

Much more important is it to find out the cause of the constipation; for on this depends the treatment, and whether it is to be successful or not. But if the causes of constipation are extremely numerous, they may and should be classified in two categories, according as to whether the symptom is secondary or not, to some well-established anterior pathological condition. There are thus two kinds of habitual constipation—symptomatic constipation, and essential or primary constipation.

Symptomatic constipation has the most various origins, sometimes easy to discover, sometimes requiring to be sought with care. To introduce order into the enumeration, we may class the causes according to the pathogenic mechanism in the train of which they follow. In this way we can pass over in silence a large number of causes, the enumeration of which would be superfluous, and which naturally fall into one or other of the divisions of our table. It can also be easily understood that certain causes can, according to the circumstances, act by different mechanisms. Thus a polypus of the rectum can cause constipation (1) by mechanical obstruction; (2) by the spasm which is at times added to the mechanical obstruction; (3) at a later stage by consecutive paralysis.

(*a*) Constipation may be symptomatic; of a *mechanical obstacle* to the passage of the feces; for instance, *external compression* of the intestine, as fibrous bands, displacements of the intestine by abdominal tumors, or the gravid uterus; also of *internal obstructions* resulting from tumors of the intestine itself, or from decrease of the caliber of the gut due to cicatrisation of dysenteric or tuberculous ulcers.

(*b*) *Reduction of the contents of the intestine* is the natural consequence of organic or spasmodic contraction of the esophagus or pylorus; in diabetes it is the liquid, not the solid portion of the contents, that is diminished.

(*c*) *The suppression and the alteration of the biliary secretion* leads to constipation; first, by decrease of the intestinal contents, the daily amount of bile excreted by the liver being about a pint; then by the loss of the physiological stimulation that the bile exercises upon the muscular fibers of the intestinal wall. Constipation habitually accompanies marked biliary obstruction. Further, it is a frequent phenomena of that interesting condition described by Gilbert and Lereboullet under the name of simple cholemia which is seen daily.

(*d*) To complete this etiological table, I must mention *intestinal paralysis* produced by very varied diseases as in the course of peritonitis or appendicitis on the one hand, or by medullary lesions on the other.

(*e*) *Spasms of the intestine,* occurring in one or more parts of the canal, hindering the passage of the contents. It is to spasms of this kind that Glenard attributes rightly the constipation of enteroptosis (where the intestine has fallen from the flabbiness of the abdominal muscles) and the hard cords along the site of the colon that are the palpable sign of it. They are also caused by lead-poisoning, by fissure of the anus, through reflex action. They are also caused in certain circumstances by affections of the brain and spinal cord, or even by neurotic states.

(*f*) Finally, habitual errors in general hygiene and diet often have a place in the genesis of symptomatic constipation, but I have already insisted on the importance of this factor.

When a careful examination of the patient, and a careful inquiry into the etiology fails to bring to light a clear cause for inveterate constipation, we are forced to conclude that we are dealing with an essential or primary habitual constipation, and it is necessary to admit that in spite of the number of varied etiological conditions mentioned above, this is a conclusion at which we often arrive in practice. Essential constipation is therefore frequent.

But we must first ask if this nomenclature is strictly accurate. It is possible, probable even, that, with the progress of pathology, idiopathic constipation, considered as a separate morbid entity, may disappear from our books, as many other symptoms have done

—icterus and dyspnea, for example—formerly looked upon as distinct diseases and now relegated to the rank of simple symptomatic elements; but it is none the less true that at the present day there are a considerable number of subjects whose disease cannot be explained by any of the etiological reasons given above, and for whom we are obliged to preserve the title of idiopathic constipation.

It must be admitted that the intimate nature and the real origin of this morbid state are still very obscure. According to Dunin and Bouveret, the condition is only a form or, if you wish, a symptom of neurasthenia. But I have already said that in addition to almost all neurasthenics being constipated, it would be necessary for all the constipated to be neurasthenic.

It is necessary to remember, for it is in accordance with clinical observation, that essential constipation is rather a disease of the well-to-do than of the workman, of the office stool and of the sedentary than of out-of-door occupations, of the citizen than of the peasant, of the meat-eater than of the vegetarian, and among its victims the attacks are more in the winter than in the summer; it is very frequent amongst the obese and amongst the gouty; it appears to have a special predilection for certain families; once it is installed it is difficult to eradicate—"I have always been inclined to constipation," say many of our patients.

Some have explained habitual constipation by atony, or even atrophy, either of the muscular wall of the intestine, or of the muscles of the abdominal wall, or again by loss of sensibility in the rectum, which no longer reacts to the stimulus caused by the presence of fecal matter. The first is insufficient to explain spasmodic constipation; it has never been anatomically demonstrated. The last appears to me to be much more satisfactory.

Whatever theory of idiopathic constipation may be accepted, it is in any case indisputable that there are two clinical varieties of habitual primitive constipation—the spasmodic and the atonic—both characterized by the loss of the sensibility of the intestinal mucous membrane to the need of defecation, and by the suppression of the reflex action arising therefrom, but differentiated from each other by a certain number of clinical signs.

In the spasmodic form, the matter is oval shaped and the lumps separated from each other; this is due to the division and reformation of the fecal mass by the action of the intestinal spasms; on inspection, the abdomen is as a rule not distended, but rather flat, sometimes boat-shaped; on palpation the intestine is contracted and hard, especially in the region of the sigmoid and descending colon; careful examination of every portion of the colon gives the sensation of the hard cord to which Glenard attaches so much importance. The contracted intestine is often sensitive or even painful to palpation; sometimes a row of hard scybalæ, more or less voluminous, can be felt. Sometimes over certain segments we find the soft sensation that is associated with the atonic form. This usually occurs in cases of old spasmodic constipation, where there is an atonic dilatation, due to the feebleness of the muscular fiber behind the site of the spasm.

In spasmodic constipation, the washing out of the intestine is often very badly tolerated, and, especially if the pressure used is too strong, the liquid is evacuated immediately after its introduction into the intestine. As regards the general condition, those who suffer from spasmodic constipation are usually of a nervous, excitable disposition; we must not, however, attach more importance than is necessary to this point; the former deserve much more attention.

In atonic constipation, the form of the matter approaches much more to that of the normal motion, and scybalæ, when they exist, are most frequently conglomerated. On inspection, the abdomen is usually distended, tympanitic; it is not sensitive to palpation, and manual exploration shows the cecum and the region of the sigmoid to be encumbered with fecal matter. The cecum is often gurgling, and under the pressure of the finger the intestine gives the sensation of a soft doughy mass.

In these cases washing out of the intestine is well stood, and at the first attempt the intestine allows itself to be distended by a pint to a pint and a half of liquid without reacting. The muscular fiber has lost its contractility. Generally the general nervous condition corresponds to the state of innervation of the intestines, and the patients who suffer from this form are atonic and debilitated.

We see therefore that there are certain distinctions between the spasmodic and the atonic forms which permit of an easy diagnosis in most cases, and this is of the greatest importance from the point of treatment. There are, however, circumstances where the differentiation is difficult, and cases are observed, rarely it is true, where the patient passes successively from one form to the other, The treatment of accidental constipation is not difficult. Numerous are the means at the disposal of the physician; the difficulty is to make the selection when there are so many. We must be guided in this by the age, the sex, the previous state of health of the patient, etc.

As for the treatment of habitual constipation, it must vary according as the disease is symptomatic or not. In the first case, the only rational treatment is to suppress the cause when that is possible; for instance, remove the fibroma or the ovarian tumor, or correct the malposition of the uterus, etc. When the cause cannot be suppressed, the treatment becomes analogous to that of essential constipation, that is to say, difficult, variable according to its form, and proper attention must be paid to the following: (1) Appropriate diet; (2) hygienic rules and physical agents (hydrotherapy, massage, Swedish gymnastics, electrotherapy); (3) internal drugs; (4) enemas and suppositories; (5) thermal cures, that is to say a whole arsenal of therapeutics, the use of which must be carefully watched and regulated.

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Stated Meeting, November 13, 1902.

Rowland G. Freeman, M.D., Chairman.

A Case of Meningitis Treated by Lumbar Puncture.—Dr. S. Ormond Goldan reported this case, which was chiefly of interest because it was a successful application of this procedure as a therapeutic measure. The patient was a child of eleven months, and the illness had been ushered in by obstinate vomiting and a state of apathy. Following these were complete paralysis of the right side of the body with left ptosis, and convulsions up to the fifth day of the disease. By that time the temperature had reached 105° F., and the child was practically comatose. A swelling had appeared at the fontanelle on the second day. On the fifth day, lumbar puncture was done between the third and fourth vertebrae, and 14 cc. of fluid removed. This caused immediate improvement, and in two weeks the child was well. Apparently this simple and comparatively safe procedure not only served to confirm the diagnosis, but, by reducing the tension, favored absorption, just as in some cases of pleuritic effusion the removal of a small quantity of the fluid is followed by prompt absorption of the remainder.

A Case of Achondroplasia.—Dr. Charles Herrman reported this case, presenting the patient, a boy of fifteen years. The child was born after a natural labor, but did not sit up until five years old, and did not walk until the age of seven. In the face of this remarkable tardiness it was interesting to note that the first tooth appeared at the age of nine months. At the present time, the head was nearly that of a boy of his age, but his height was that of a boy of seven years, his trunk corresponded to that of a boy of thirteen, and his lower extremities to those of a boy of only four and a half years old. The fingers are nearly all of the same length, the femur is slightly shorter than the tibia and the intelligence is below the normal. The legs are markedly curved, partly owing to tibial curves and in part due to an abnormal articulation at the knee. In this strange condition the chief pathological process was found in the bones and epiphyses, the cartilage being made up of irregular groups of cells instead of cells arranged in columns. One of the best diagnostic signs was the disparity between the trunk and extremities. As a rule, these children died in infancy, but if they survived this period they usually became remarkably strong. This boy had recently been placed on thyroid treatment, but it was not expected that it would prove of special value. This disease had been described under several different names, *i.e.*, fetal rickets, fetal myxedema and fetal chondrodystrophy or achondroplasia.

Adherent Pericardium.—Dr. George M. Swift presented a paper on this subject, and also two pathological specimens. He said that the disease could not be so very rare because since 1886, in St. Mary's Hospital for Children, where about 350 medical cases are admitted annually, there had been 18 cases of adherent pericardium. This also showed that acute pericarditis could not be so very rare in children between the ages of two and fourteen years. All of the hospital cases terminated fatally, and in most of them an autopsy was held. It was noted during life that cardiac stimulants usually acted badly, and that enlargement of the liver was often the first sign of adherent pericardium. In many of them there was no valvular lesion, and the presence of murmurs was explained by the firm union between the heart and chest wall. Most of the cases had their origin in rheumatism, though some developed in the course of a pleuropneumonia. Tuberculosis of the pericardium was a disease of later life. On inspection of the chest, the cardiac impulse would be found diffused, and sometimes there would be a drawing in of the intercostal spaces during systole. The liver becomes enlarged by congestion, and may extend down to the level of the umbilicus. Death occurred on an average about five years after making the diagnosis of adherent pericardium. If the rheumatism could be controlled and the child given plenty of nitrogenous food along with favorable hygienic surroundings, the prognosis was good.

Dr. Rowland G. Freeman said that very little was written about the subject of adherent pericardium, and the author's statements were entitled to great weight, because while pathologist at the hospital he had had ample opportunity to verify the correctness of Dr. Swift's diagnoses of adherent pericardium.

Dr. Jacob Sobel asked if Dr. Swift's experience justified him in accepting the German view that the so-called paradoxical pulse is pathognomonic of adherent pericardium.

Dr. E. Libman said that this peculiar pulse merely indicated some interference in the mediastinum; it might be from tumors as well as from adherent pericardium. It was noted in cases of open ductus arteriosus.

Dr. Swift said that he made no mention in his paper of the paradoxical pulse because it had not aided him in the diagnosis of adherent pericardium. The first case of this kind that he had seen had been in 1886, in a girl of seven years with ascites. The jaundice, cachexia and marked enlargement of the liver led him to suspect malignant disease, and when at the autopsy he had found only an enlarged and congested liver with adherent pericardium he had resolved to study this condition with care. It was worthy of note that when the circulatory conditions improve in these patients it is indicated by a diminution in the size of the liver, and *vice versa*.

PELIOSIS RHEUMATICA IN CHILDREN, WITH A BRIEF REVIEW OF THE LITERATURE.—Dr. Henry Heiman read a paper with this title. As a result of his review of the literature, he suggested the following as a convenient classification: (1) Purpura simplex, characterized by hemorrhages into the skin but not into the viscera, and occurring *sui generis*; (2) purpura hemorrhagica, marked by severe hemorrhages, including hemorrhages from the mucous membranes; (3) purpura fulminata, and (4) peliosis rheumatica. The last named condition was characterized by purpuric eruptions and multiple arthritis, the onset being marked by sore throat and slight fever. The changes in the urine were those indicative of acute renal congestion. The disease ran a self-limited course, though relapses in children were very common. The eruption was more abundant than in adults and more joints were usually affected. The disease had first been described in 1801 under the name of purpura urticans. Fuchs, who had given a good deal of attention to it, laid great stress upon the occurrence of desquamation, and declared that the duration was ten days to two weeks and that the prognosis was good.

Dr. Heiman reported the following case, seen in the hospital service of Dr. H. Koplik, because of the number of joints affected and the occurrence of the purpuric spots in the mouth and on other parts of the body than the inflamed joints. The patient was a boy of eight years, and when first seen the purpuric spots were visible on the buccal mucous membrane, on the hard and soft palate and on both faucial pillars. There was also a diffuse eruption in the cervical and inguinal regions, and upon the scrotum and feet. Nodular infiltrations were on the arms and forearms. The percentage of hemoglobin was 65 and the urine was normal, save for a trace of albumin. There were frequent stools containing mucus and blood. All of these phenomena gradually diminished during the first week, but in the second week spots appeared above the elbows, and a systolic murmur developed, which was heard over the lower part of the precordium, loudest at the apex, and was not transmitted to the left. The murmur and most of the other signs and symptoms disappeared in the third week, and although there were several relapses, the boy completely recovered in about three months.

Dr. Jacob Sobel said that such of the cases as he had seen had occurred at that time of the year when rheumatism was most common and responded well to the salicylates. The case reported seemed to correspond to the descriptions of Henoch's purpura.

Dr. Sarah Welt-Kakels reported a case of peliosis rheumatica which she had seen last summer in a child of four years. The joints of the lower extremities were painful and there were some hemorrhagic spots. The heart, blood and urine were negative at first, but subsequently a cardiac murmur appeared at the apex, and was still present, as was also a mitral insufficiency. In the early part of the disease the rectal temperature varied between 100° and 103° F. In this case also there was a relapse before final recovery.

Dr. C. Herrman said that about two years ago he had presented a typical case of Henoch's purpura to the Harlem Medical Association. He was reminded by the peculiar epigastric pains in these cases of the crises of tabes, but they were recovered from very quickly. In some respects the disease resembled angio-neurotic edema. He suggested the theory that the hemorrhages and pains were dependent upon a vasomotor neurosis of central origin.

Dr. George M. Swift reported a case occurring in a girl of eleven years, who had been on a sufficiently varied diet before coming to the hospital. The illness had begun with symptoms of a cold, followed on the third day by pain in the leg and foot. On admission, there were purpuric spots on the trunk and face, including the eyelid which was much swollen. On the hard palate was an ecchymotic swelling, and there were submucous hemorrhages into the uvula and and the right tonsil. Notwithstanding these changes the appearance of the child pointed to good general health. The urine was normal and the body temperature 101.2° F. In about three days the conjunctiva became ecchymotic, and the ears, wrists and hands swollen and discolored. The gums were swollen and the stools were tar-colored. In about a week the patches on the skin became red and elevated and began to itch. It was necessary to discontinue the salicylates because of persistent delirium, and chloride of calcium was substituted. Another three weeks passed before the child was able to be around.

Dr. L. E. La Fetra said that the swelling of the lower eyelids was uncommon, though he happened to have such a case under observation at present. In this patient there were tender spots all over the body, together with sore throat and a temperature between 100° and 101° F.

Dr. E. Libman said he had made at one time cultures and bacteriological examinations in four or five of these cases, but in every instance with negative result. He looked upon the disease as a toxemia rather than an infection. The occurrence of relapses on getting out of bed was hard to explain on the theory of an infection.

Dr. B. Lapowski said that Dr. Swift's case showed very clearly that under the term, peliosis rheumatica, were included several affections, among others, erythema nodosum. The diagnosis of peliosis rheumatica was not warranted either in children or in adults until gonorrhea had been carefully excluded.

Dr. Heiman said he had noted desquamation only in cases presenting a papular eruption. The epigastric pain he would explain as the result of a myositis. Dr. Swift's case appeared to be a rather unusual form of peliosis rheumatica.

PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, November 11, 1903.

DR. SAMUEL MCCLINTOCK HAMILL, Chairman.

DOUBLE MITRAL STENOSIS.—Dr. Leo Bernd reported a case of double mitral disease, probably congenital. The child is two years and a half old. Its birth was normal. The family history is of interest only in that the mother had several attacks of articular rheumatism, and had very severe, prolonged rheumatism while pregnant with this child. When the child was first washed it was noticed that the chest was prominent. The boy has never been strong; from earliest infancy, his color has always been dusky. He has a cough, which increases upon lying down; he sweats upon the slightest exertion; he has an adenoid face, seems very weak, and breathes through his mouth. The right and left side of the thorax give the same measurement. The sternum is keel-shaped, and there is a marked Harrison's groove. The apex-beat is displaced outward, although the shape of the chest makes this fact of doubtful importance. There is abnormally wide pulsation, and a decided thrill in the second interspace on the left. Auscultation shows a loud, blowing, systolic murmur, heard over the whole chest, but particularly at the apex, and from there toward the axilla. There is also a diastolic murmur toward the apex. Both second sounds are accentuated, the pulmonic being particularly sharp. The cardiac dulness reaches a quarter of an inch to the right of the sternum.

The occurrence of rheumatism in the course of the pregnancy; the absence of the history of any disease as a cause of acquired rheumatism in the child; the rarity of articular rheumatism in children under two years of age; and the fact that the child has always been delicate and cyanosed, led to the belief that the disease is congenital. The physical signs are those of mitral regurgitation and stenosis. As a congenital lesion, this condition is decidedly rare.

Dr. J. P. Crozier Griffith said that the case showed some interesting features not often seen in congenital heart disease. Some of them might be construed to prove that the disease was postnatal. He thought, however, that the lesions had probably developed before birth. It was evident, however, that the case was not one of the more usual forms of congenital cardiac affection. Dr. Bernd had advanced the view that the accentuation of the pulmonary second sound is a proof of the fact that the disease is located in the mitral valve. Dr. Griffith believed that the accentuation might easily be such an indication; but stated, on the other hand, that it is a well recognized fact that in the most frequent forms of congenital heart disease, viz.: the combination of pulmonary stenosis with patulous ductus arteriosus and perforate septum—the pulmonary second sound is often very greatly accentuated. He was obliged, therefore, to throw out this accentuation as a proof of mitral disease, unless upheld by other symptoms. In the case presented, he believed that it is thus upheld. There was a diastolic murmur audible at the position of the nipple and a little to the right of this. This was most probably due to a mitral stenosis and, if this is true, the systolic murmur present is probably the result of mitral regurgitation. Its points of maximum intensity and diffusion did not appear to be those of the murmur of perforate septum. The case further exhibited a curious fact—that the area of cardiac dulness was decidedly increased, especially to the right. One of the most frequent statistics of congenital heart disease is an absence of any great evidence of cardiac hypertrophy or dilatation. This hypertrophy in the present case, Dr. Griffith considered to be in favor of the existence of mitral disease; yet it militates, to some extent, against its being congenital. On the whole, however, he was convinced that the case is probably one of congenital stenosis and insufficiency of the mitral orifice.

Dr. A. A. Eshner said that—on the doctrine of probabilities, if for no other reason—he thought that there is a perforate septum. That the lesion is congenital seemed to him almost unquestionable, because the symptoms of cardiac disease were noticed from birth, and because of the entire absence of any of the conditions that are likely to give rise to heart disease. He believed that there was but one murmur, and that was systolic.

Ataxia.—Dr. S. M. Hamill presented a boy, aged two years and nine months, who had shown cerebellar symptoms after a fall.

On the 25th of October he fell down five stairs, striking the back of his head on the floor. He cried for a little time after, but was apparently not much injured. Prior to this time his health had been perfect. On the second day after the fall he wakened in the morning, looking pale and refusing to walk. He ate his breakfast, after which he vomited. When placed on the floor his father states that he was able to stand, but in attempting to take a few steps staggered and fell over. He gave no evidence of fever; there was a history of slight pain in his knees and calf muscles, but no evidence of head pain. For eight weeks prior to admission he had had a coryza and mild conjunctivitis. He never had any ear pain or discharge from his ears; he had had no recent acute illness.

On examination it was found that the child when placed on the floor could stand alone, but in attempting to walk he had a very marked staggering gait, showing a tendency to fall to the left. Occasionally he did fall and always to the left. His knee jerks were much exaggerated. Aside from this there was practically no abnormality discovered. His temperature at this time was 97.5° F.

The patient's condition began to improve after a few days and by the end of two weeks the symptoms had almost entirely disappeared. The condition was looked upon as probably due to congestion resulting from concussion or hemorrhage into the cerebellum as a result of the fall.

Dr. Harland said that the history stated that the child had had a very severe cold for several weeks before and during this attack. Swelling of the Eustachian tube from this cold would lead to its occlusion;and consequent pressure upon the labyrinth by exudates in the middle ear could produce vomiting and a staggering gait, lasting for twenty-four hours or more. This was suggested as a possible explanation of the case.

Dr. Charles W. Burr, in discussion, said he thought that the child's gait had become perfectly normal. The case is very obscure, and he feels very doubtful as to its diagnosis. He has never seen organic ataxia lasting but a few days, and then passing away entirely, and he knows of no case in which this has occurred in organic cerebellar disease. It is much easier, said he, to tell what the condition is not than to determine what it is. He considers hemorrhage extremely improbable, as a hemorrhage large enough to cause these symptoms would have caused more severe symptoms; and even a small hemorrhage would have produced more persistent symptoms. He doubts whether the history of a fall is of much importance in the case. The parental history of many conditions in children very frequently includes the story of a fall, for falls are every day occurrences in childhood. In this case the child was said to have had only a slight tumble, and to have played afterwards; and the cerebellar symptoms did not come on for some time thereafter. This fact seems to Dr. Burr to make the injury an improbable cause of the condition.

Encephalitis, he thinks, is also very improbable, because of the transitory character of the symptoms, the absence of any residual symptoms, and the absence of fever while the symptoms were present. Dr. Harland had just suggested the possibility of middle-ear disease as a cause. The speaker thought this suggestion worthy of serious consideration, as being, perhaps, the best explanation that had been offered.

Dr Eshner asked whether the question of commotion, or concussion of the brain, had been taken up. The history of a fall makes such a cause seem possible, and it appeared to him that commotion would explain the symptoms, particularly in view of their transitory character.

Dr. J. H. Jopson considered Dr. Eshner's suggestion a very rational explanation of the condition. Dr. Burr had referred to the fact that the symptoms did not come on until many hours after the accident, and had said that he did not think that hemorrhage could have been present. In concussion or commotion, however, we have punctate hemorrhages; and there is no reason why these should not have been present in this case. That the symptoms in commotion may be very severe, and yet disappear very rapidly, is shown by the case of a boy seen by Dr. Jopson last spring. In this case, signs of concussion appeared, lasted for a short time, and were then followed by an intermediate stage of some hours; after which, unconsciousness followed by convulsions and by other signs suggestive of rupture of the middle meningeal artery, was noted. These symptoms were so pronounced as to lead to trephining. No hemorrhage was found, however, and the boy appeared practically well the next morning. He has had no further cerebral symptoms.

Dr. Burr asked Dr. Jopson whether he had ever seen a case of concussion after a slight fall with an interval of many hours, during which there had been absolutely no symptoms, the symptoms of concussion then appearing for the first time—or, rather, a staggering gait appearing, with no symptoms of concussion.

In saying what he had in regard to hemorrhage, Dr. Burr had referred purely to gross hemorrhages into the cerebellum; and not to punctate hemorrhages into the whole brain, such as occur in concussion. He does not believe that this child had a gross hemorrhage into the cerebellum, nor does he think that the symptoms are compatible with a diagnosis of concussion.

Dr. Jopson said that he had not seen any case in which there was a prolonged period of freedom from symptoms just after the accident, followed by symptoms of concussion; and the fact that such a period did occur in this case is against concussion. The fall, however, was a serious one, and would seem to have a direct relation to the symptoms; and the speaker believes that concussion must be considered possible in the case.

Dr. Hamill in closing said that the remarks he had made in presenting the case seemed to him in entire agreement with Dr. Burr's views as to the absence of encephalitis and hemorrhage. He had said that he thought the condition due to congestion, which was probably associated with commotion. Middle-ear disease had been thought of, but had been excluded, because the ataxia was so marked and continuous while it lasted, and because it had persisted for a week. If Middle-ear disease had been present and had caused such prolonged symptoms, it would certainly have given rise to recognizable local signs of its presence. He had no knowledge of the reflexes in the ataxia due to middle-ear disease, and he asked Dr. Burr to give him some information regarding the state of the reflexes in this condition.

In this case they were greatly exaggerated, which fact made him firmer in his belief that cerebellar disorder was present.

Dr. Burr said that the only cases of ataxia in ear-disease that he had seen were instances of Ménière's disease. The patients had no middle-ear disease, and no disease of the Eustachian tube; hence, the conditions in these cases are not comparable with those in the cases under discussion. They, however, did not show any alteration in the knee-jerks. This is his personal experience alone; therefore, he could not say whether it is the usual condition in Ménière's disease.

Dr. Hamill had said that this patient had shown an increased knee-jerk. As a matter of fact, an increased knee-jerk in connection with cerebellar disease means, as a rule, that the disease is not confined to the middle lobe of the cerebellum; but that it is causing pressure upon the motor tracts, or that there is coincident disease of those tracts. In pure disease of the middle lobe of the cerebellum, the knee-jerks are, as a rule, absent; therefore, Dr. Burr believes that there is no special stress to be laid upon an increase of the knee-jerks, in considering the question of disorder of the cerebellum in this case.

Dr. Hamill then read a review of some of the older writings on maternal nursing. There was no discussion.

CHRONIC INTESTINAL INDIGESTION.—Dr. Theodore Le Boutillier reported a case of chronic intestinal indigestion with acute exacerbation and meningismus. The patient was a child two and a half years old that had always been healthy, except for some constipation and a capricious appetite. At the time of the attack, there was a marked increase of the constipation, followed by vomiting with fever. The child developed delirium; began picking at its bed-clothes; and showed nystagmus, rigidity of the neck and back, and muscular twitchings. There were two distinct convulsive attacks, following which a left-sided paralysis of the facial muscles was noticed. There was then a third convulsive attack, which was followed by stupor, persisting for twenty-four hours. After this, there was improvement. The nystagmus disappeared two days later, the paralysis cleared up within a week, and in three weeks the child was running about in good health.

Dr. Griffith referred to the fact that meningismus and meningitis resemble each other closely in many instances. One is often in doubt whether the symptoms are due to a toxic or to a truly inflammatory involvement of the meninges. This is so generally recognized that some writers are disposed to class all or nearly all kinds of meningismus as instances of a serous meningitis.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Stated Meeting, December 11, 1902.

R. G. Freeman, M.D., Chairman.

Simple Method of Examining Milk.—Dr. Henry L. K. Shaw of Albany demonstrated this method, one of the principal features of which was the adaptation of the ordinary centrifuge used for urinary work to the analysis of milk.

Cases of Foreign Body in the Intestine.—Dr. L. Emmet Holt reported these cases. The first was that of a child of six months, who kept a number of physicians guessing for several weeks as to the cause of its peculiar fever. Following an ordinary attack of measles there was a sudden return of the fever. This was found to be due to a double acute mastoiditis, and although the membrana tympani were promptly punctured the temperature continued to vary between the normal and 106° F. The temperature would remain about normal in the forenoon, or perhaps until three o'clock in the afternoon, and then would rapidly rise almost to 106° F. The father, who was a physician, satisfied himself by frequent examinations of the blood that malaria could be excluded. The lungs remained absolutely normal. Finally one morning in the third week the child was discovered to be cyanosed, and the nurse, who had allowed him to play with a paper of safety-pins, removed a handful of these pins from his mouth, and it was thought that he had swallowed only one of them. However, five days later three safety pins were discharged from the rectum, one of them being bent like a fish-hook. A few days after this the child had a constipated movement, which the trained nurse pronounced to be free from pins, but the anxious mother undertook a personal examination of the stool, and succeeded in finding four pins. It might be said that the child recovered before a diagnosis had been made.

Dr. Holt also spoke of a child, who, while playing with some toys, swallowed a sugar-tongs, 1½ inches long, and a knife, a little longer than the tongs. In still another case, in which he had made an autopsy, the cause of the child's sudden death was found to be a safety pin which had become impacted in the larynx.

Acute Pyogenic Infection in the New-Born.—Dr. Holt also reported this case. An infant, who was being nursed outside, was returned to the hospital, with the history of having been well for the first fourteen days of its life, and of then developing, from the fourteenth to the eighteenth day, a number of dark spots. At first they were few in number, and appeared on the extremities, but in the course of three days they became very abundant, and were found not only on the extremities, but on the lower half of the face and on the neck. These hemorrhagic spots were about a quarter of an inch in diameter, were of irregular shape, and were surrounded by redness and induration. There was slight hemorrhage from the umbilicus, but none into the eyes or from the gums, though on the gum at a point corresponding to the upper incisor tooth was a hemorrhagic area about half an inch long. The viscera were normal with the exception of some enlargement of the spleen. On admission, the rectal temperature was 100.8° F. The child failed rapidly, and died after being in the hospital two days. At the autopsy, some atalectasis was found in the left lung, and there was an abundant purulent exudate over both the convexity and base of the brain. The ventricles of the latter were distended with serum containing flocculi of pus. Dr. Martha Wollstein made the bacteriological examination, preparing cultures from the pus on the brain and from the blood of the heart and liver, as well as from the spots on the skin. A pure growth of the staphylococcus pyogenes aureus was obtained from these sources. Dr. Holt commented on the fact that there had been no symptoms of meningitis present, and also upon the absence of peritonitis. The latter was in keeping with his experience in other similar cases. The occurrence of this case had led the New York Foundling Hospital to make a rule that no infants should be sent out from that institution until the umbilicus had healed.

Dr. H. L. K. Shaw of Albany said that the report of the foreign bodies swallowed reminded him of a case seen last winter with Dr. Hun. The patient was an infant of ten months with a high fever and no obvious cause for the same. Examination of the blood showed no leucocytosis. The cause of the illness became apparent when, on the fifteenth day, a long bristle was passed from the rectum.

Dr. J. Finley Bell of Englewood said that he was surprised to learn that in one of the cases an enema had been given. This was just what should be avoided, for it was a recognized plan of treatment to feed infants who had swallowed a foreign body upon a dry, bulky diet, and the giving of an enema would tend to liquefy the feces.

Dr. Holt referred to a child who had developed an obscure intestinal disorder, the nature of which had only been made clear upon the passage of a large ball of hair. It was then learned that the child was accustomed to sit upon a bear's skin rug, and it had evidently swallowed some of the hairs from this rug from time to time. This case suggested that it might be well to avoid giving little children toys covered with hair or wool.

Report of a Case of Adenoids with Malaria.—Dr. Walter F. Chappell reported this case. The subject was a little girl, who, at the age of one month, developed some nasal obstruction. When five months old he had operated, removing ten small fragments of lymphoid tissue from the nasopharynx. This operation was followed by immediate improvement in the general health, but a few weeks later the little one suddenly became irritable, restless and feverish. Because of some enlargement of the spleen he suspected malaria, and inquiry elicited the fact that the parents had carefully screened the little patient from mosquitoes all summer, but the netting had been inadvertently left off ten days previously, and at that time she was bitten in two places. These bites were so severe as to last for two weeks. Examination of the blood confirmed the diagnosis of malaria by showing the presence of the tertian organisms. During the progress of the case it became necessary to give very large doses of quinine, so that altogether 241 grains were given in 27 days. Subsequently he had obtained 30 mosquitoes from this locality, and 3 of this number were anopheles.

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN.

An ordinary meeting of the above Society was held at the rooms of the Medical Society, 11, Chandos Street, Cavendish Square, London, W., on Nov. 21, 1902. Dr. A. E. Sansom, Chairman.

Mr. F. Deas exhibited a boy, aged 1 7-12 years with deformities of the right hand. The thumb was normal, but the index and middle fingers were joined by a thick fleshy union as far as the first inter-phalangeal joint. At birth the middle and third fingers had been united by a web of thin skin, but this had been cured. There was no little finger. An X-ray photograph showed the left femur to be shorter and smaller than the right which was 1¾ inches longer. Mr. A. H. Tabby discussed the case.

Dr. Henry Ashby of Manchester showed a lardaceous liver from a girl of 10 years, who had been under observation for four or five years with a hypertrophic condition of the forearms and tibiæ. At the necropsy the kidneys were found to be large, white and lardaceous: the spleen was also lardaceous. The liver was extremely so, and on the surface were 15 or 16 gummata of the size of small nuts; there were also scars. Prof. Délépin had confirmed the gummatous nature of the lesions by microscopical examination. After some remarks by the Chairman, Mr. D'Arcy Power asked if the joints were examined at the post-mortem, and whether the bone thickening, noticed during life, was due to periostitis. Mr. Tabby inquired whether pneumonia alba was present. Dr. Theodore Fisher of Bristol spoke of having seen a similar case in a boy of 9 years. Mr. Clement Lucas raised the question of the treatment of the osseous lesions of hereditary syphilis, which he regarded as practically incurable. Dr. Ashby in reply said that neither the bones nor joints were examined at the post-mortem; only hypostatic trouble was found in the lungs. He agreed that mercury and iodide of potassium had little effect upon osseous lesions in such cases.

Dr. C. O. Hawthorne showed (1) a girl, 9 years of age, the subject of circumferential cicatrix of the abdominal wall and of the left thigh, attributed to constriction of the umbilical cord; (2) a case of bi-lateral coloboma of the iris, choroid and optic nerve.

Mr. R. C. Dun of Liverpool communicated the notes of a case of traumatic subcutaneous rupture of a spina bifida. The patient was 6 years old, and had had a lumbo-sacral spina bifida from birth. After the child had been run over by a light milk cart, the spina bifida disappeared without any external escape of fluid. A swelling appeared over the left dorsum ilii a fortnight after the accident, and a few days later the spina bifida reappeared. The child was unable to lie on her back and suffered great pain from the time of the injury, and there was partial paralysis of the bladder. On operation the sac of the spina bifida was found to be abnormally thick. A small opening on its left side communicated with a very thin sac, adhering to the overlying tissues and passing out 3 in. over the left glutei muscles. A number of nerves were adherent to the thicker sac, and these were returned to the spinal canal. The sac was successfully excised. The pain disappeared; the bladder paresis was unchanged.

Mr. Dun also gave notes of (2) a case of ectopia of the bladder without division of its walls: partial epispadias, incomplete descent of testicles.

Dr. George Carpenter read notes of a fatal case of leukemia in a child of 3½ years. The liver and spleen were enlarged, and both palpable lymphatics could not be felt. The red blood-corpuscles were 31%, the hæmoglobin 15%; ratio of white corpuscles to red was 1-12. The increase of white corpuscles was chiefly small lymphocytes, together with large mononuclear leucocytes. At the necropsy the liver exhibited lymphoid infiltration in the portal canals, and there was extensive lymphoid infiltration of the cortices of the kidneys. The mesenteric glands were enlarged, and some contained tubercle bacilli. Some of the lymphatic glands and bronchial glands were slightly enlarged. The leukemia was of 5 weeks duration.

Mr. Sydney Stephenson showed a girl of 4 years, with tuberculosis of the conjunctiva of the left eye. The condition had existed for two months, and was associated with considerable enlargement of the glands below the left lower jaw. The child had lost weight since these symptoms began. No consumption could be found on either side of the family. The lids of the left eye were semi-closed and clearly thickened, presumably from lymphangitis. There was a considerable quantity of trachoma-like material in connection with the semi-lunar fold. The lower palpebral conjunctiva was found to be bestrewn with miliary granulations and folds of granulation tissue, but no ulcerations could be found. The superior retrotarsal folds showed similar changes. The cornea was clear. The diseased material showed a typical picture of tuberculosis when microscopically examined. No tuberculosis was found elsewhere, so that the infection appeared to be primary. Mr. Alfred H. Tabby discussed the case.

EDITORIAL

SALUTATORY.

In opening the new year, the eighth anniversary of our birthday, we do so with feelings not untinged with pride and with regrets. Pride that we have been able to give to the profession seven years of unfaltering service and have received their cordial and loyal support. Regrets that we have not been able to do more for our many subscribers who have stuck with us through thick and thin, and have helped build up a journal second to none in this country in its specialty.

The New Year is entered with the hope of much greater possibilities. Some changes have been made in the Editorial Departments and we have moved our offices to the Presbyterian Building, No. 156 Fifth Avenue, and are thus in the center of the publishers' district.

With the present number a new system is inaugurated. We are giving a colored cover, and the semi-monthly distribution is changed to a monthly with double the number of pages of our former issue.

Thanking our many friends for their support by contributions and by their subscriptions we enter the new year with the renewed hope of being able to give more largely to the profession than ever before.

FORMALDEHYDE IN BACTERIAL INFECTIONS.

The history of the search for intracellular antisepsis is of comparatively recent origin; although in reality it may be said to have had its origin as a logical outgrowth of the doctrines of Pasteur and of Lister.

The chief aim of the early followers of the Listerian formulæ was the killing of microorganisms on the surface of an organ or more particularly the prevention of outside contamination; the cleansing of intra-visceral septic collections, following their opening, was a corollary that soon followed, but the doctrine of antisepsis seemed to have been unavailing when the blood stream became affected by pyemic organisms.

True intracellular antisepsis obtains to an effective extent at the present time in but two diseases, diphtheria and malaria. The antitoxin in the one, however, is a chemical antidote to a poison, in large part at least—quinine is a true protoplasm poison and kills the malarial organisms without prejudice to the erythrocyte host. But this organism is an animal one, and it is a notorious fact that the lower plant forms are much more tenacious of life than their animal cousins. It may be that mercury is a true bactericide for the syphilis organism, but thus far we are in the dark concerning the true factor in this disease.

The use of the colloidal salts of silver and of mercury may also be said to serve to some effectiveness at least, as intracellular antiseptics, for it seems undoubtedly true that Crede's methods have been successful in some conditions of bacterial autoinfection.

The latest claimant as a vital antiseptic is formaldehyde. At first sight, when one bears in mind the powerful fixative qualities of this substance on blood plasma and blood cells, it might seem preposterous that such a powerful toxic agent could be used with safety in the blood stream. But the facts of biology are more stable than the guesses of man. It is known that formaldehyde is one of the first products in the constructive metabolism of plant life. All sugars and all starches have been made by the union of water and carbon dioxide in the chlorophyll grains of plants and the first union of one molecule of each is formaldehyde. Hence its presence is not incompatible with the presence of living activities. It is true that in plants it is readily converted into other products by renewed synthesis, but it has been there in certain concentrations, and has been of service.

It may be that further careful experimentation may show that formaldehyde may be taken in proper dilution in the blood and then prove of service in the fight with sepsis—perhaps it may not be a direct bactericide— but may stimulate other protective agencies in the human warfare. Let us hope for some farreaching results, bearing in mind interpretations of results.

ABSTRACTS

The Supposed Infectivity of Desquamation in Scarlet Fever.—C. Killick Millard (*Lancet*, April 5, 1902) discusses the subject of the infectivity of desquamation in scarlet fever, and believes that there is not sufficient evidence at hand to justify the general opinion that the desquamated cuticle of scarlet fever is infectious *per se*. After consultation with numerous physicians connected with fever hospitals throughout England, he finds them quite uniformly agreed that (1) they can adduce no evidence that the desquamating epithelium is *per se* a source of infection; (2) they consider that too much importance has been attached in the past to desquamation as a source of infection; (3) their experience does not support the popular view that desquamation after scarlet fever is necessarily an indication that a patient is still infectious; (4) they believe that a patient may continue to desquamate for some time after he has ceased to be infectious; and (5) they do not believe that it is necessary, in order to prevent the spread of infection, that patients who otherwise are quite ready to leave the hospital should be detained until every visible trace of desquamating epithelium has disappeared.

The writer questions the supposition that the flakes of epithelium from scarlet fever contain the germs of the disease in the same way that the pustules and scabs of smallpox are believed to do. The eruption, being an erythema, is a process characteristic of chemical poisoning or of poisoning by the chemical products of microbic action rather than of the direct action of microbes themselves. Thus it is quite analogous to the erythematous rashes caused by the use of certain drugs and by septic absorption, these erythemata being often followed by desquamation. Desquamation much more profuse than that seen in scarlet fever follows the eruption of erythema scarlatiniforme desquamativum, yet there is no reason to think that the process in any of these cases is a microbic one.

The writer has endeavored in a small way to collect statistics by observing whether patients discharged from hospitals while still desquamating, though otherwise apparently free from infection, were more frequently followed by "return cases." Of 2500 cases discharged, 8 per cent. showed some trace of desquamation; but of the cases which carried out infection (by giving rise to "return cases") only 6.5 per cent. had been noted as showing traces of desquamation. In the absence of bacteriological evidence, it appears that the only way in which this question can be settled is by specially collected statistics.

Erysipelas in a Young Infant Cured with Antistreptococcus Serum.—R. G. Rijo (*Cronica Médico-Quirurgica de la Habana,* Year xxviii, No. 20.) believes that the efficacy of antistreptococcus serum in erysipelas is demonstrated through the cure of an infant of three months, with a hypodermic injection of 20 cc. of the serum. The child was first seen by Rijo upon the twentieth day of the disease, when the affection had become generalized; having spread gradually from the feet up to the trunk despite all previous treatment. Improvement was sufficiently marked and rapid after the first injection to make a second unnecessary; and treatment was limited thereafter to applications of guaiacol liniment; a cure being effected within twelve days.

Fat-Splitting Ferment in Stomach.—Volhard (*Ztschr. f. klin. Med.,* 1901, xlii. 414; xliii. 397). Of much interest is the discovery that the stomach contains a fat-splitting ferment, which, like pepsin and the rennet-ferment, is secreted by the fundus of the stomach. This ferment does not appear if unemulsified fats or oils are mixed with the watery contents of the stomach, but acts very powerfully on natural (yolk of egg, cream, milk) and artificial emulsions. Experiments show that the fat-splitting ferment corresponds entirely to pepsin and rennet-ferment, in its relations to acids, alkalies, etc., and follows the same changes in diseases of the stomach.

Influence of Foods on Gastric Secretion.—The researches of Herzen, Radzikowsky and Mark-Schnorf, at Lausanne (*Arch. f. d. ges. Physiol.*, 1901, lxxxiv. 101, 513; lxxxv. 143 respectively) confirm the well-known conclusions of Paulow. These researches show that some of the most generally used foods cause a flow of gastric juice; *i.e.,* by a specific chemical action on the mucous membrane they so stimulate it that it at once begins to pour out an abundant secretion. These foods include red meats, meat-juice, broths, Liebig's extract, milk, gelatine, certain peptones, and water. The last acts only in large amount. It does not follow, however, as might be thought from the researches of Schiff, that secretion and pepsin formation always go together, are one and the same thing. This view is untenable; the substances which cause secretion of gastric juice act through the nervous system, and have no action when introduced per rectum, whilst those which cause pepsin-formation act through the blood, and are efficient when absorbed per rectum. Herzen and his pupils have now shown that Liebig's extract acts more especially in causing secretion of juice, dextrin in formation of pepsin; *e.g.,* that these are food stuffs, which act in one only of these ways. Alcohol acts powerfully in the former, and vitellin and liver-glycogen in the latter way. These observations lead to many practical results; the physician may, according to the nature of the case, influence the quantity of gastric fluid secreted or the amount of pepsin formed. Favorable results have followed from the administration of a mixture of Liebig's extract and dextrin in suitable amounts.

A New Sign of Tetany.—DR. M. SOLOVIEFF (*Russki Vratch,* 1902, No. 26) has observed two adolescents suffering from tetany, who, in addition to the Trousseau and Chvostek phenomena, presented quite violent rhythmic contractions of the diaphragm. These were perceptible to both inspection and palpation, synchronous with the cardiac systole. At the same time a feebly-whistling sound is heard, which is produced by the penetration of a certain quantity of air into the left lung, sharply inflated at each contraction of the diaphragm. These spasmodic contractions, which can be verified by radiographic examination, are produced, in the author's opinion, by a direct irritation of the phrenic nerve (in a state of hyperexcitability) by the movements of the heart. They cease only during effort and deep inspiration. This new sign of tetany Solovieff proposes to designate by the term "the phenomenon of the phrenics."

Peritonitis from the Vulvo-Vaginitis of Children.—J. COMBY (*Arch. de méd. d'Enf.,* Paris, September, p. 513) considers that gonococcic peritonitis is by no means an uncommon complication of vulvo-vaginitis; and in a recent paper on the subject he describes eight cases which he had under his care within the last two years in the Hôpital Trousseau and in the Hôpital des Enfants Malades. In some of the cases in which peritonitis supervened, the vaginal discharge was in an acute stage, while in others it was chronic. Comby believes that peritonitis only follows in cases of gonococcic vulvitis, and that cases of vulvitis caused by streptococcic or staphylococcic infection are never complicated by peritonitis. The infection passes by the vagina, uterus, and tubes to the peritoneum. The onset is usually sudden, and occurs in a child in apparently good health, for even in those cases terminating fatally the vulvo-vaginitis has seldom been of a severe type. The abdomen becomes tender and tympanitic, the child vomits repeatedly, lies with the legs crossed, dreads the slightest touch, and screams with pain. The temperature rises perhaps to 104° F., but, in spite of such high fever, the extremities remain cold and cyanosed. Frequent micturition occasionally occurs, and diarrhea and constipation alternate with each other. The duration of the symptoms is from one to eight days.

The diagnosis may be very difficult, as, when peritonitis occurs, vulvo-vaginitis seldom suggests itself as a cause, and even if it does, it may be so slight as to escape notice. Appendicitis is usually, and often wrongly, suspected. In all cases of peritonitis in children the external genitals should be examined, and if vulvo-vaginitis is discovered, the question of gonococcic peritonitis should be entertained. The prognosis is good on the whole, many cases recovering, and relapses are exceptional.

Influence of Preservatives upon the Food Value of Milk.—C. F. Doane, and T. M. Price (*Bulletin No.* 86, *of the American Agricultural Experiment Station,* September, 1902) say that the experimental work upon which this report is based has been carried on for two years or more, the object being to determine the effect various antiseptic substances have upon the digestibility and food value of milk. Calves have been used in the study, but with the full understanding that what might prove injurious to an infant might be devoid of deleterious effect on the more robust digestion of the calf. The extent to which preservatives are used in milk and other foods is amazing, but only a few States have made a determined fight against the use of preservatives in milk. This method of preservation of food products is comparatively recent, and has been employed since non-poisonous antiseptics have been known. Since that time the traffic has grown to large proportions. Milk is a perishable food that is with difficulty gotten into the hands of the consumers in a palatable condition. Even if the preservative added to milk was harmless, it enables the producer to dispense with some necessary care in its handling, such as prompt cooling after it is gathered. These circumstances alone would make a preservative not an unmixed blessing. The more preservative added to the milk, the less ice is required, and while the argument might be advanced that a milk to which a certain proportion of antiseptics had been added would be less deleterious than one which was decomposed, the practical study of these substances shows that dealers use just sufficient to get the milk into the hands of consumers in a fairly good condition. The same result could be accomplished without the use of a preservative, only it would require more care and expense on the part of the dealer.

The conclusions arrived at after an extended series of experiments are to the effect that boric acid and formaldehyde in the proportions commonly used in milk do not affect unfavorably the digestion or nutrition of mature animals. That these results cannot be applied to infants is shown by the work of Annette, who conclusively demonstrated that preservatives were harmful in kittens, and in some cases fatal. Taking all the facts into consideration, it would seem that until more definite knowledge to the contrary is obtained the safest course to pursue is to discourage the use of preservatives in milk in every way possible.

Acute Diabetes in a Child Three Years of Age.—F. B. Swartzlander (*New York Medical Journal,* vol. lxxvi. No. 16, p. 679, Oct. 18, 1902). The rarity of diabetes in young children gives special interest to this case. The family history was negative. The disease began in August, 1902, with an attack of indigestion. Soon after this it was noticed that the child had to be taken up frequently at night to urinate, and that during the day it was unusually thirsty. This condition grew worse until the drinking of water or milk became incessant. The child would not eat and grew rapidly pale and weak. The urine voided gradually increased in amount. When the child first came under observation, four days before her death, she was pale and weak. The emaciation was not marked. The skin was almost transparent, the nails had a bluish tinge, and the hands and feet were cold. The eyes were dull and lusterless, the tongue was pale and slightly swollen, and the lips were almost colorless. Examination of the lungs was negative. The heart was weak, with a slight anemic mitral murmur. The abdomen was not sensitive nor enlarged.

The urine had a specific gravity of 1.048, the reaction was acid, and it contained 3.2 per cent. of sugar and no albumin. A considerable quantity of diacetic acid was found. The quantity in twenty-four hours was 400 cubic centimeters. On the second and third days the condition remained about the same, but the amount of urine was less, and on the third day the sugar fell to 1.4 per cent., with a marked increase in the diacetic acid. Early on the morning of the fourth day the child died in diabetic coma.

Paradoxical Pseudo-Hypertrophy Following Infantile Cerebral Hemiplegia.—L. PIERCE CLARK (*Journal. Nerv. and Ment. Dis.*, Nov., 1902) reports on the rare phenomenon of hypertrophy occurring in the infantile cerebral palsies. He has reported in all five of the 12 cases upon record. After a review of the literature, the author proceeds to an analysis of all cases in which the hypertrophy occurs. The family history, intra-uterine life, birth, sex and causes leading to the stroke, throw no light upon the occurrence of the condition. All cases recorded prior to these in this paper developed in subjects of athetosis and hypertrophy was in those parts most agitated; but in four of his own the author found no athetosis but a partial epilepsy of the post-hemiplegic type instead. The enlargement in some of the previously reported cases involved all parts that were paralyzed, even the breasts, testicles and face of the side involved showed hypertrophy. The skin, fat and muscles may all hypertrophy in a single case, although some muscle hypertrophy is present in every case. The hypertrophy has been in the upper extremity in all cases but one. The order for the increase of size of these parts is the arm in nine cases; the forearm in two; the calf in one. The particular muscles entering the hypertrophy in order of their greatest involvement are: biceps, deltoid and triceps. The parts not hypertrophic follow the general rule of atrophy in such lesions. In two of the author's cases true fiber hypertrophy existed; an enlargement and increase of the muscle spindles were found. Usually hypertrophy and hyperplasia went hand in hand. In all cases the hypertrophy was found of the pseudo variety. The hypertrophic parts were found invariably weaker than those of the sound side. Bony hypertrophy was present in the author's, in Lannois's and Foyalle's cases. Occasionally the bones of the entire upper extremity may hypertrophy, although usually those underlying the enlarged muscles increase in size. The degree of circumferential enlargement varies from one-quarter to seven-eighths inch, although not usually more than one-half an inch. The author believes that the cause must obtain under the following conditions: "The lesion is cortical, slight and transient; the integrity of the elements remains more or less intact and a post-hemiplegic disorder of motility, such as athetosis or a focal epilepsy, by agitation of the paralyzed parts, causes the hypertrophy." The article is accompanied by excellent photographs showing the states of hypertrophy.

An Epidemic of Infantile Paralysis.—C. F. Painter (*Boston Medical and Surgical Journal*, Dec. 11, 1902) reports an epidemic of thirty-eight cases, in Gloucester, Mass., of 25,000 inhabitants. In this epidemic only one death is known. The writer was not able to see all the cases, but more or less detail is known of thirty. The youngest child was 13 months old, the oldest 10 years; twenty-one cases were 3 years or younger; eight cases 2 years or younger; seven cases 4 years or older. None of the cases observed fully recovered. Diseases of an infectious character are comparatively rare in the region in which this epidemic occurred, but the death rate for the year 1900 had been higher than for five years previously. There were a few cases of death from cerebrospinal meningitis during the two months in which the epidemic prevailed. An investigation of the milk, ice, and meat supplies showed that all three of these articles were secured indiscriminately, and in no way could the infection be attributed to them. A number of epidemics of infantile spinal paralysis have been reported since Colmer described an epidemic of "teething paralysis" in 1843. The epidemics commonly occur in the summer or early autumn. This is one of the largest reported epidemics, the cases all having occurred within an area of four square miles, and within a period of two months. Nothing is known definitely of the possible source of infection.

Antistreptococcic Serum for Scarlet Fever.—J. Moser (*Wien. klin. Woch.*, 1902, No. 41) points out that in many cases of scarlatina a streptococcic infection can be made out. Out of ninety-nine cases of fatal scarlatina, he has been able to cultivate streptococci from the blood in the heart in sixty-three cases. These results accord with those of previous investigations, and make it probable that streptococci play an important part in the disease. On the other hand, the use of ordinary antistreptococcic serum has not proved of use in treating the disease. Moser points out that this may be due to the fact that there are different varieties of streptococci. The organism isolated from scarlatina differs from other varieties found in other diseases in being almost innocuous for rabbits, and in possessing different agglutinating properties. Moser therefore prepared a special immune serum for streptococci obtained from scarlet fever cases. As there is no proof yet that the organism is the same in all cases, he produced a polyvalent serum by injecting horses with increasing doses of a mixture of living cultures obtained from different cases of scarlet fever. The organisms were grown on bouillon, and were not passed through animals. After months of such treatment, the serum was drawn off and preserved in a sterile condition, without any addition of a preservative. The serum was tried in eighty-four cases. At first the dose was too low. Later, better results were obtained using doses of 180 cc. Possibly the serum was more potent in the later cases. The individual doses varied from 30 to 180 cc.; the latter amount is now chiefly used. In seventeen cases classed as mild or moderately severe there was no mortality. In sixty-two cases classed as severe and apparently hopeless there were sixteen deaths. The earlier the injection the more favorable is the result. The chief clinical result is the rapid improvement in the general condition. With early injection the rash may not fully develop, or may fade much sooner than usual. The disturbance of the central nervous system vanishes in a short time, while the temperature and pulse often show a critical fall. The symptoms of heart weakness are favorably influenced. The throat clears up quicker, and, though superficial necrosis is not prevented, Moser has never observed deep destruction. As yet, nothing can be said about the effect of the serum on the renal and middle-ear complications. The whole course of the disease is shortened, and convalescence occurs much sooner. Injection of normal horse serum and of Marmorek's polyvalent streptococcic serum had no effect on the course of the disease. Serum rashes were often noted, but joint pains and abscess formation were rarer.

Scarlet Fever with Relapse.—H. FRAZER (*Lancet,* Nov. 29, 1902) says that relapses in scarlet fever have not been frequently recorded. Many hold that in such cases the primary attack has not been scarlet fever, and that the relapse is merely the result of infection through confinement in a scarlet fever ward. The importance of recording cases of undoubted relapse is therefore very great. He tells of a case in which no apparent doubt can attach itself to the diagnosis either of the primary infection or of that which evinced itself in the relapse. The patient was twenty years old, and was admitted into the Aberdeen Fever Hospital, June 8, 1902, suffering from scarlet fever. There was a well-marked punctate rash, accompanied by a suffused erythematous blush extending from the neck downward, all over the body. The eruption had appeared first on the day previous to admission. The tongue was much reddened and papillated; it was a typical raspberry tongue. The throat was much inflamed, but there was no membranous deposit. The submaxillary glands were slightly enlarged. There was no desquamation and the urine was normal. The morning temperature was 99° F., and that in the evening, 99.6° F. On the day after admission the patient's temperature rose to 102.6° F., and on the next day it was 103° F. Rheumatic pains in the left shoulder and both knee-joints were now complained of. Salicin was administered. On June 9 a carbuncle developed on the nape of the neck. Signs of fluctuation were evident on the twelfth, when an incision was made and the purulent contents evacuated. Healing took place rapidly. The rheumatism disappeared, the temperature became normal, and on the nineteenth the patient was able to get up. On the twelfth desquamation had been observed on the neck and hands, which gradually increased in amount, and by the twenty-second was very profuse. On the twenty-sixth, six days after the patient had been allowed to get up, a severe attack of diarrhea and vomiting occurred, and on the same day a very severe punctate rash appeared, which by the next morning extended over the whole body, the face being free. The tongue was thickly coated, the throat was much swollen and congested, and the submaxillary glands were enlarged. Twenty-fourth. The temperature had risen from normal to 102.6° F. The urine contained no albumin. By the twenty-eighth, three days later, the rash had disappeared, the tongue was papillated and cleaning, and there was some greyish, membranous deposit on the throat, but the diphtheria bacillus was not found. The temperature gradually fell to normal, remaining so until July 3, when there was a slight rise for a day or two, and the urine contained a slight trace of albumin. Soon afterwards the patient became convalescent. As already mentioned, the desquamation which followed the first attack was extremely abundant; that following the relapse commenced and extended in an identical manner. On the hands it was observed as a powdery substance, and was easily observed when drying the hands after washing. On the feet and legs it was, save for the lessened amount, similar in every respect to the primary desquamation. On August 4, after nearly two months in hospital, the patient was discharged free from infection. As regards the origin or the relapse or second attack, two explanations are, the author thinks, possible: (1) That it was simply an instance of autointoxication in the patient whose immunity was short-lived; (2) that a fresh strain of the poison was contracted by the patient on getting up. Coupled with the fact that immunity after the first attack was not fully developed, the latter theory is, he thinks, the most probable.

Tetany and the Myotonia of Infancy.—M. Hochsinger (*Rev. mens. d. mal. d. l'Enf.,* Paris) describes a condition which he defines as a myotonia of nurslings, and which he regards as a neurosis of young infants, differing materially both from tetany and from the pseudo-tetany of Escherich.

Tetany is essentially characterized by intermittent and tonic contractures affecting chiefly the muscles of the hands and feet, and accompanied by hyperexcitability of the motor nerves and muscles. This hyperexcitability constitutes, in the author's opinion, the most essential condition of tetany, and all other symptoms must be subordinated to it. The infants do not lose consciousness. The most important symptom of this hyperexcitability is the phenomenon of Chvostek, which consists in the sudden contraction of the orbicularis palpebrarum on tapping over the site of the branches of the facial nerve.

Another sign pointing in the same direction, and frequently associated with Chvostek's phenomenon, is Trousseau's symptom. Neither of these phenomena is present in cases of myotonia, but the author describes a symptom occurring in this condition which he defines as "the phenomenon of the fist," which consists in a contraction of the hand on pressure being applied to the nerves of the brachial plexus, and which is only seen in infants of from 6 to 8 weeks old. This sign is not dependent upon hyperexcitability like Trousseau's symptom, but upon the imperfect development of the inhibitory centers which preside over the reflexes. True tetany is to be regarded as exclusively a neuromuscular affection developed on a rachitic foundation. According to Kassowitz, the largest number of cases of tetany occur during the spring months, completely disappearing as the summer advances, which corresponds to the time of the year during which rickets is most prevalent. Myotonia, on the other hand, has no association with rickets. It usually develops during the course of gastro-intestinal attacks, from autointoxication, and, like them, occurs chiefly during the autumn months. The author summarizes the differences between the two conditions in the following propositions:

The contractions of myotonia are persistent, and last for several weeks, whereas in tetany they are intermittent and paroxysmal. In tetany the attacks come on suddenly, while in myotonia the onset is gradual. In myotonia there is no mechanical or galvanic hyperexcitability of the nerve or muscles, and there is no facial irritability. Neither laryngo-spasm, nor the tonic and intermittent spasm of the respiratory muscles, which occur so frequently in tetany, are ever present in cases of myotonia. Myotonia occurs during the early weeks of life and during the autumn months, whereas tetany appears at a much later stage of infancy, and almost invariably in spring. Myotonia is never associated with rickets, while the relationship between tetany and rickets is a very constant one. The contractions have a tendency to recurrence in tetany, while in myotonia the attack disappears with the cause. The treatment by phosphorus, which gives excellent results in tetany, has no effect on the spasms of myotonia. In tetany the fingers are usually included in the spasm, whereas in myotonia the fingers are not involved, the contracture being limited to the hand.

The Leucocyte Count in the Summer Diarrheas of Children.—Messrs. Knox and Warfield (*Johns Hopkins Hosp. Bull.,* Baltimore, July, 1902) in an interesting and exhaustive paper on this subject briefly summarize their conclusions as follows:—(1) A differential count of leucocytes in the blood of well children under two years of age, when compared with the blood of adults, shows that there is a relative increase in the small mononuclear elements, and a decrease in the number of polymorphonuclear cells. (2) In the summer diarrhea of infants the number of leucocytes in the blood is usually increased, but the count of the white cells varies within such wide limits, even in the milder forms of the affection, that a high or low leucocytosis cannot be regarded as of diagnostic value. (3) In the simple dyspepsias of childhood, a differential count of the leucocytes does not show any marked variation from that of a healthy infant, but as the case becomes more severe in type there is apparently a progressive increase in the polymorphonuclear neutrophile cells, and a decrease in those of the small mononuclear variety, thus presenting a picture more like that of adult blood. (4) Polymorphonuclear leucocytosis is an indication of an intoxication with decomposition products in the intestine, or of the toxines of pathological bacteria, *i.e.,* it takes place both in the cases of acute intestinal poisoning and in the more severe forms of ileocolitis. (5) The cases of simple infantile atrophy present a nearly normal differential leucocyte count, but an increase of the polymorphonuclear cells indicates the setting in of an inflammatory intestinal complication.

A New Diphtheria Serum.—Wassermann (*Deutsche med. Woch.,* Leipzig, Oct. 30, 1902). It is well known that the present and valuable diphtheria antitoxin has no bactericidal action on the diphtheria bacilli, at least outside the body. They can even be made to grow in it. Search has long been made for a serum antagonistic alike to the organism and its toxin, but so far unsuccessfully. In certain other diseases, such as typhoid, cholera, and plague, a serum has been obtained which is antagonistic to the organism of these diseases. Such a serum is distinguished by the name antimicrobic. In the case of the well known antitoxic serum of diphtheria, its inoculation into the human body will protect that individual against subsequent infection with diphtheria, or assist in curing him if he be already infected, and its action is very simple: it merely enters into chemical union with any free toxin finding its way into the blood. The result of this union is a harmless compound. Now, if an antimicrobic serum be inoculated into an animal infected by its specific bacilli, it gradually brings about the destruction of the bacilli, but in a somewhat complex way. So far as this is at present known, there appears to be more than one reaction dedependent upon different properties in the serum, and these may be differently possessed by different sera. The phenomenon of agglutination exemplified in the Widal reaction depends upon one of these. A serum having this reaction possesses a substance called agglutinin, which causes the bacilli to adhere together in clumps. These are, in most cases, then precipitated, though some authorities hold that this latter action is due to a separate substance called precipitin. These phenomena are related to antimicrobism, but they do not of themselves result in the actual destruction of the bacilli. This is accomplished, however, by another property in the serum which dissolves the bodies of the bacilli, known as a lysogenic action. This lysogenesis is a most important phenomenon, and it is exhibited by sera towards a great variety of cells other than bacteria. It has come to be spoken of as cytolysis, and the substances capable of causing it as cytolysins. Wassermann claims to have discovered an antidiphtheritic serum, which antagonises alike the diphtheria bacillus and its toxin; which, in other words, is both antimicrobic and antitoxic. It is true that the present antidiphtheritic serum, though it is only antitoxic, and not antimicrobic, is a powerful protective and curative agent, and it is not easy to understand how it can be so when it has no action upon the bacteria themselves. When it is remembered, however, that its action within the animal tissues may be somewhat different from what it is *in vitro*, this result becomes more easily understood. The antitoxic serum counteracts all the diphtheria poison as quickly as it is formed, hence tissue destruction ceases, and the natural bactericidal powers of the invaded tissues are exerted to their fullest extent, gradually bringing about the destruction of the now harmless bacilli. This is doubtless the explanation of the method of cure in the great number of successful diphtheria cases, in which the patient not only completely recovers himself, but ceases also to be a source of infection to others. It does not, however, account for those cases in a certain proportion of which, though recovery is apparently complete, the bacilli, in a virulent state, are found either in the throat or nose or air-passages. The individual who harbors these bacilli is himself immune to their action, but he remains a source of danger to others. The bactericidal powers of his tissues are apparently insufficient to bring about the destruction of these bacilli; hence it would certainly be an advance if we possessed a serum capable, when injected, of destroying them. Wassermann's method of obtaining this serum is ingenious. He injected dead diphtheria bacilli into rabbits, etc. If living bacilli, even in small numbers, are injected, the animals mostly die. The bacilli are heated to 60 deg. C. for twenty-four hours, and further dried in an exsiccator, and pulverized in a mortar. The powder is extracted with 1 per cent. ethylendiamin solution. To 1 grm. of diphtheria bacillus powder 20 cc. of ethylendiamin solution is added. It is shaken several times in a special apparatus, and, after standing for twenty-four hours, it is filtered and centrifuged. This gives a clear fluid of a yellow color, containing substances (intracellular) obtained from the bodies of the bacilli. Acetic acid gives with it a copious precipitate. Death from diphtheritic poisoning followed its injection (1-2 cc.) into rabbits. This showed that the solution contained free diphtheria toxin, derived from the bodies of the bacilli and extracted by the ethylendiamin. A quantity of diphtheria antitoxin, sufficient to neutralize this free toxin, was next added to the solution, and 2-4 cc. of this neutralized fluid injected repeatedly into rabbits. A reduction of body weight followed, showing that it was capable of causing disturbance of metabolism. The serum withdrawn from the animals thus treated, when added to the clear extract obtained from the bacilli as above mentioned, caused a cloudiness which sank to the bottom as a flocculent precipitate. This does not occur with the serum of control animals not so injected. He thinks that his serum, in addition to being of therapeutic value, may serve as an important means of distinguishing between the true and false diphtheria bacillus.

Congenital Ectopia of the Kidney.—Congenital ectopia may be distinguished from the acquired condition (floating kidney), in that—(1) the kidney is always permanently fixed in position in the absence of any inflammatory adhesions; (2) its shape is rarely normal, often profoundly altered; (3) its arteries are numerous, and arise separately from the nearest arterial trunks—bifurcation of aorta, iliac arteries, middle sacral, etc.; (4) the ureter is shorter than its fellow, and takes the most direct line to reach the bladder. The anomaly most commonly affects the left kidney, and the organ is usually placed at a lower level than normal, only very exceptionally having been found in a higher situation. It may be abdominal, pelvic, or abdomino-pelvic, and may be situated on the same side of the body as that to which it belongs, in the middle line, or even on the opposite side. The other kdiney may be normal or similarly affected.

Treatment of Enuresis.—WALDO (*Ztschr. f. diätet. u. physik. Therap.*, Sept., 1902) holds that in most cases enuresis in children is a neurosis depending on nervous inhibition of a normally developed organ, and that it is not due to muscular weakness or developmental failure. Only in a few cases is enuresis symptomatic of central disease. In treating the idiopathic cases, we find that the most diverse methods give almost equally good results, which makes it highly probable that we have to do with a functional disease. Medical treatment with drugs and hydropathy is falling more into the background. Waldo finds the best treatment is massage. The combined rectal massage of Thure-Brandt gives excellent results in functional enuresis, and, on the average, three to five applications lead to permanent cure. In some cases of symptomatic enuresis good results were also obtained. In carrying out the method the patient is put in the dorsal or knee-elbow position, and the one hand, placed just over the symphysis, is pressed against the finger of the other hand introduced into the rectum. Thus for four or five minutes the neck of the bladder is subjected to gentle circular or transverse massage movements. This simple method should always be tried, even in the incontinence of spinal disease. It seems probable that in many cases the massage acts through the influence of suggestion, and this would explain why enuresis of ten or twelve years' standing can be cured after one or two applications of massage. It is also noted that when improvement commences, the patients at first can only retain the urine during the day, while they may still be incontinent during the night.

New Stain for Diphtheria Bacilli.—W. G. SCHAUFFLER (*Med. Rec.*, Dec. 6, 1902) describes a modification of the Piorkowski stain to readily detect Klebs-Loeffler bacilli in fresh specimens from membranes or from cultures lately discovered. By this method the pole-stained bacilli of true diphtheria may be differentiated from the uniformly stained and smaller pseudo-diphtheria germs, and may be so easily used that its importance is greatly enhanced. The solutions employed to make the stain are as follows: Filtered solution Lœffler's methylene blue 10.00 cc.; filtered solution pyronin (Grübler's) 1.5 cc. (pyronin 0.5 gram.; aquæ distill. 10.0 cc.); three per cent. HCl alcohol 0.5 cc. (absolute alcohol 97.0 cc.; HCl [25 per cent.] 3.0 cc). The specimen is prepared as usual and covered by the above solution for one minute. It is then washed in running water, dried and mounted in Canada balsam. The above method will show the bodies stained blue while the poles are a bright ruby red. The pseudo-diphtheria bacilli take on only the blue color. The bacilli of Asiatic cholera and of the plague, when stained by this method, show granular bodies in their interior, but these bodies are not metachromatic like those of diphtheria bacilli just described.

Acquired Dislocation of the Hip in a Child.—MACDONALD (*Lancet*, Nov. 29, 1902) says that dislocations of the hip of traumatic origin are rare in young children; therefore the following example may be worthy of note: On August 16, 1901, a female child, aged two years and eight months, was brought to the author by her mother, who stated that the patient had fallen that morning, and, in consequence of the fall, was unable to walk. Further questioned, the mother said that her three children were playing in a bedroom with a miniature theater when one of the figures dropped from the stage, and the child, in rushing across the room to pick it up, tripped over her brother's foot and fell upon the floor. The brother raised her and set her upon her feet, but found she could not stand. The mother, finding her in this condition, carried her straight to the author's house. Although a bright, healthy little girl, she was very frightened, and resisted examination, so was sent home and seen later. The objective appearances were marked distortion of the left hip and undue prominence of the gluteal region. The limb was abducted and rotated inward, the thigh was bent slightly upon the abdomen, and the leg was flexed upon the thigh. The lower end of the femur crossed the lower third of the opposite thigh and the ball of the left great toe rested upon the instep of the right foot. There was, roughly, about one and a half inches of shortening, although this observation was not verified by measurement. The left trochanter lay well above Nelaton's line, and on rotating the limb, the head of the femur could be felt considerably above the acetabular ridge. From these characteristics there was no doubt that a dislocation of the head of the femur on to the dorsum ilii existed. Under chloroform, reduction by manipulation was attempted, but failed. Having, therefore, instructed the mother to fix the pelvis, the thigh was flexed at right angles to the abdomen, and slow, steady traction made in an upward direction. The limb was then adducted and rotated inward, and the caput femoris slipped into the cavity of the acetabulum with a distinct click. The limb was put up in a Liston's long splint and secured by a spica bandage. At the end of four days the splint was removed and the patient was permitted to lie on a sofa until the eighth day, when she was allowed to go about, and it was found that her recovery was complete. With regard to the relative frequency of dislocations of the hip in children, the author has no statistics to offer, but finds that Erichsen tells of two cases which he met with in his own practice. In one of these—a child aged one-and-a-half years, the head of the femur was dislocated on to the os pubis; in the other there was dorsal dislocation in a boy six years old. Erichsen also mentions that Kirby had seen a case of dorsal dislocation in a child aged three years, and that Madge had observed a similar case in a child aged three and a half years, while Travers had a dislocation of the hip in a boy five years of age.

PEDIATRICS

VOL. XV. FEBRUARY 1903 No. 2

ORIGINAL ARTICLES

THE CAUSES OF DEATH IN DIPHTHERIA *

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Perhaps no disease, certainly none of an infectious nature, has so uncertain a prognosis as diphtheria. Its possibilities are numerous, and its more frequent complications are among the most dangerous that may arise in the course of any disease. Even when convalescence is apparently established, the danger is not passed; for death may occur suddenly in various ways.

In a general way it may be said that death in diphtheria is due (1) to mechanical causes, (2) to the action of the toxin on the system, or (3) to one of the complications.

Mechanically, death may be caused by asphyxia, which occurs as a result of closure of the glottis in laryngeal diphtheria. Northrup and others maintain that when asphyxia occurs in the early stages of the disease spasm plays the most important rôle in the production of the laryngeal stenosis. It is a common experience at autopsies on children who died of asphyxia to find little or no membrane in the larynx, although there is a certain amount of congestion and swelling. Further, attacks of dyspnea are so readily excited by the slightest cause, and come on so suddenly, that Northrup is led to the conclusion that they are of a spasmodic nature, and are caused by contraction of the hypersensitive laryngeal muscles. But as the disease progresses, the effects of swelling and exudate become more and more marked, playing a constantly increasing part in the

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*Read before the Northern Medical Association of Philadelphia, June 13, 1902. Compliments of *American Medicine.*

production of dyspneic symptoms; until finally in the last period of the disease, asphyxia is due entirely to the presence of false membrane and edema, and spasm is no longer a factor.

The toxemic form of death in diphtheria is produced through a general depression of all bodily tissues, caused by the poisonous action of the toxalbumins elaborated by the diphtheria bacillus. In such cases the fatal termination occurs at the height of the local process. There is a malignant form in which the infection is so virulent that the system is very rapidly overwhelmed by a profound intoxication, and death takes place within twenty-four to forty-eight hours. But such cases are fortunately rare, and usually, if the patient dies from diphtheric toxemia, the fatal termination occurs between the fifth and tenth days.

Often the action of the diphtheria bacillus is complicated and aided by a streptococcus infection, forming what is called septic diphtheria. In such cases the course of the disease is most severe. Death is probably more often due to the streptococcic septicemia than to the action of the diphtheric poison. It is in these cases of mixed infection that the severe complications of diphtheria are most likely to occur.

Of all these complications, bronchopneumonia is the one most to be dreaded. It occurs especially when the larynx is involved, but may follow any case of mixed infection, whether the larynx is affected or not. Some statistics, notably those of institutions, show it to be the principal cause of death in the majority of cases of diphtheria. At autopsy the streptococcus, pneumococcus, and diphtheria bacillus have all been found in the lung lesions. Wright and Stokes believe that the diphtheria bacillus may cause the pneumonia in many instances. Councilman, Mallory and Pearce maintain that the pneumococcus must be regarded as the principal agent in producing the lung infection. Most authors, however (notably Prudden and Northrup), attribute its occurrence to the streptococcus, which finds access to the lung by inspiration from the foci of disease in the upper air passages. Bronchopneumonia usually occurs at the height of the disease, and is naturally most fatal then, although it may come on at any period, even in convalescence after the membrane has entirely disappeared from the throat.

The kidneys are more or less affected in almost every case of diphtheria of moderate severity, but the nephritis of diphtheria usually runs a favorable course. However, it happens occasionally that the kidneys become extensively diseased, in which event all the symptoms of acute uremia may develop, and the case may end in death that is directly attributable to the renal condition. Fatal nephritis is most likely to occur in cases of septic diphtheria.

Perhaps the most distressing mode of death in diphtheria from the physician's point of view is that due to heart failure. This complication may occur early in the disease or late, even after convalescence is seemingly established. It may happen in cases of great severity or in the mildest cases. When heart complications develop early they occur in patients suffering from a severe form of the disease. In late cases they make their first appearance in the third or fourth, or as late as the sixth or seventh week, after the disappearance of all traces of local disease. Holt, in his textbook on "Diseases of Infancy and Childhood," vividly describes the onset of heart failure in such cases as follows:

> "It often happens that the patient is regarded as convalescent, and the great vigilance of the previous days or weeks has been relaxed. The physician has ceased his frequent visits and looks in once a day to satisfy himself that the patient is doing well and all congratulate themselves that the danger is over. If the pulse is carefully watched it is one day discovered that it is weaker than formerly and occasionally there is slight irregularity. It is usually slower, but may be more rapid than normal. On inquiry it is found that the patient does not take his food so well, that he has refused stimulants, and perhaps has vomited once or twice. Slight dyspnea is noticed and the face is paler than usual. Sometimes within twenty-four hours from the beginning of such symptoms the patient is dead. The changes for the worse occur very rapidly. The pulse becomes weaker, more irregular, often abnormally slow, but very rapid on slight exertion, and there may be a sense of precordial weakness or distress. There are dyspnea without cyanosis, anxiety, and great restlessness, but the mind is clear. There is vomiting if food and stimulants are taken. The extremities are cold. Auscultation shows feeble and indistinct heart sounds, but no murmur. The pallor is extreme. Death results from sudden syncope, sometimes during an attempt to administer food, sometimes from such slight exertion as turning in the crib."

Occasionally death from heart failure may occur without warning or previous symptoms. But usually if the patient is watched carefully some such premonitory symptoms as have been described will be observed.

The explanation of heart failure in diphtheria is not the same in all cases. Not infrequently cardiac thrombi play an important part in producing the fatal result. This was found by Hibbard to have occurred in 3 out of 21 cases of death due to heart complications which were examined by him. This author thinks a possible explanation of such cases is the occurrence of endocardial degenerations, which act as foci for the formation of the thrombi. When death occurs suddenly, following some muscular effort or excitement, without premonitory symptoms, it is in all probability the heart muscle which is most at fault. If the heart failure is ushered in by prodromal symptoms, it is probably the result of a toxic neuritis of the vagus nerve, and is thus a form of postdiphtheric paralysis. Changes in the heart muscle, however, occur in so large a proportion of cases of diphtheria that it is probable both pathologic conditions will be found at autopsy; and it is difficult, often impossible, to distinguish between the symptoms caused by each lesion.

The pathology of these myocardial changes has been extensively worked up, notably by Romberg, and by Councilman, Mallory and Pearce. The results of these investigations are fairly uniform. Fatty degeneration is the simplest change found, and occurs alone in the severe cases of short duration. In more prolonged cases the fatty degeneration accompanies and seems to precede more advanced forms. In the latter there is complete destruction of the muscle tissue, which is converted into hyaline masses. Accompanying these parenchymatous changes there is an interstitial myocarditis, consisting of a round-cell infiltration of the heart walls, which may, in advanced cases, lead to fibrous changes. The cause of these degenerations in the heart and its nervous supply is undoubtedly the action of the toxalbumins generated by the diphtheria bacillus.

In some cases of sudden death, apparently from cardiac paralysis, it may be found at autopsy that there is a hyperplasia of the thymus gland, lymph nodes, spleen, and other lymphoid tissues, associated with a hypoplasia of the heart and the aorta. These changes form what has been called the "lymphatic constitution." They have been found frequently in cases of sudden death from various causes, and are believed by many to indicate a diminished vital resistance and a special liability to cardiac paralysis. The study of this condition has been especially directed toward deaths under chloroform narcosis. But it is maintained that some sudden fatalities in the course of certain infectious diseases, markedly those occurring in convalescence from diphtheria, may be in part referable to the presence of the lymphatic constitution. We know little, however, of the chain of events leading to the fatal result, and, as Ewing says, we are compelled to content ourselves with the statement that the subjects of the lymphatic constitution, for some unknown reasons, are specially susceptible to reflex cardiac paralysis.

Changes in the nervous system, due to the action of the diphtheric poison, are of quite frequent occurrence. Here, as in the case of heart complications, paralytic sequels may follow either a mild case or a severe one, although, of course, more likely to occur in the latter. The lesion produced is a peripheral neuritis. From our present standpoint, the most interesting forms of diphtheric neuritis are those which cause cardiac or respiratory paralysis. Cardiac paralysis has already been mentioned. Respiratory paralysis may be due to involvement of the phrenic or the intercostal nerves, most frequently the former. Death is rarely, if ever, sudden. The symptoms may extend over two or three days, and consist of dyspneic attacks of gradually increasing frequency and severity. They are attended by extreme anxiety, distress and apprehension on the part of the patient. There is a constant dread of impending suffocation, which dread is unfortunately only too well founded, for death is the usual termination.

Finally, diphtheria may be complicated with other infectious diseases, and in very many cases the combinations are most deadly. This is especially true of combinations of diphtheria with measles, scarlet fever or typhoid fever. In such cases death may be caused by the development of bronchopneumonia or of a general sepsis, or it may be due to the overwhelming effects of the combined toxins of the diseases in question.

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CONGENITAL NYSTAGMUS (HEREDITARY)

By Wm. J. Greanellé, M.D., of New York.

The following cases may prove to be of interest to the readers of Pediatrics who have seen the case reported by Fischer in the December number. I can report a congenital nystagmus in grandfather, mother and children. Grandfather M. L. has been known to have had nystagmus from infancy with associated (nodding) movements of the head. He is now sixty-eight years of age and while the nodding movement has largely subsided (to be more marked during anger or excitement) the nystagmus persists. There are no eye-changes other than the refractive changes incident to old age and a life of study.

His daughter, Mrs. S., aged thirty-six years, has a much more pronounced nystagmus, which has been present from birth and which was in early childhood associated with movements of the head (rotary and nodding). No eye-changes are present other than a mild degree of myopia. She is a very hysterical subject and is of a very excitable nature. In her case the oscillations are constant, quite wide, with a finer tremulous nystagmus when an attempt is made to steady the eye while looking sidewise. I have seen three of this woman's brothers and in none of them is nystagmus present. Her son, R. S., aged twelve years, a boy of unusually nervous temperament and very great activity, has a similar nystagmus to his mother's, with occasional nodding movements of the head. A sister, aged six years, has occasional slight nystagmus. Neither of these children has any eye-changes.

As Fischer points out, the persistence of the nystagmus in adult life, in the cases of the mother and grandfather, corroborates the statements that the nystagmus was truly congenital, although head movements are present. Noyes remarks that most frequently nystagmus is seen in albinos. The family reported above are all decided brunettes.

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LUMBAR PUNCTURE AND ITS VALUE, ESPECIALLY IN CASES OF MENINGITIS

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I have ventured to publish the following remarks not because I have frequently performed the operation of lumbar puncture, but because so many questions have been raised, even so far as an expression of doubt as to its justifiability, that I think an exchange of opinion on the subject will be useful.

The technic.—Lumbar puncture for the withdrawal of cerebro-spinal fluid was, it will be remembered, first introduced into practice by Quincke, and for the last four years an enormous number of observations have been accumulated, chiefly by French observers.

The technic is simple enough, the object being to perforate the dura mater well below the level of the termination of the cord, and for this purpose the interval between the third and fourth lumbar spines is chosen; this region is also on a level with a line joining the highest parts of the iliac crests.

The position of the patient is important; the operation may be carried out either in the sitting or recumbent posture, and in the former the body must be well bent forward and the arms crossed over the chest; if the latter posture is adopted, the knees should be well drawn up into the abdomen wall, the trunk bent, with the arms carried well forward.

After carefully preparing the skin and needle, this is thrust firmly between the spines, either just external to the middle line or in the middle line; it is then pushed upwards, and if the external site has been chosen, also carried slightly inwards. In a child it will penetrate the theca after having passed about 2.5 cm.; in the adult the distance is considerably greater.

The sensation experienced the moment the needle pierces the dura is unmistakable, and almost immediately the cerebro-spinal fluid will well up through the opening.

The most common cause of failure to obtain fluid is that the theca has not been pierced; generally a bone has been hit by the needle; occasionally the point may become blocked by lymph, etc. Occasionally the fluid obtained may be colored with blood; if not due to any morbid condition, it usually results from repeated failures to find the space between the laminæ, and the consequent rupture of muscular capillaries, or in rarer instances may be due to perforation of a vein of the theca. No harm follows, but it is as well to postpone further examination, since the results may be vitiated for diagnostic purposes.

The normal fluid is clear and of a watery consistence; sp. gr. varies from 1004 to 1007. It contains a trace of a reducing substance, which is not sugar, and about 0.7 per cent. of sodium chloride. It contains practically no cellular elements, and has a freezing point which is 0.9 or 0.7 below zero.

In disease all these features may be altered. In jaundice it may be yellow, or in cerebral or meningeal hemorrhages red, from the presence of blood. Its sp. gr. usually rises; in inflammatory conditions it may become turbid, contain flakes of lymph and many cellular elements, and also microorganisms.

The normal formation of the fluid.—(1) It is established that the amount present varies directly with the venous pressure and with the capillary circulation. This capillary pressure is increased by (1) compression of the abdomen, (2) the assumption of the horizontal position, (3) straining and forced expiration, and hence the same conditions increase the rate of formation.

Mr. Larkin recently showed us a case in which the c.s. fluid was running away through the nose, and in a similar case of St. Clair Thompson it was found that the flow could be increased at will by adopting these methods.

It was calculated that as much as 500 c.cm. was formed in the twenty-four hours.

(1) Although therefore there is a close correspondence between the amount secreted and the cerebral capillary pressure, the fluid is not merely a pressure exudation. It is partly a secretion, in the formation of which the endothelial cells of the choroid plexuses and various lymph channels of the brain exercise a selective action.

This is shown by two kinds of evidence.

(*a*) Although the amount of salts found is about the same as in the blood, lymph and transudations, the amount of organic solids varies greatly.

(*b*) Certain substances injected into the blood stream do not find their way into the c.s. fluid; such are iodide of potassium and methylene-blue. It is even asserted that LiCl so nearly allied to NaCl does not pass into the fluid.

A perversion of these normal physiological processes leads to the distinguishing features of morbid states. To take the more important of these briefly *seriatim:*—

(1) *The freezing-point, or cryoscopic point.*—All pure substances have a perfectly definite melting-point, and this is also the freezing point of the liquids, provided some of the *solid* substance is present; thus water can be cooled to a temperature below zero, but on addition of a spicule of ice the whole solidifies and the temperature rises to zero. If, however, there is some other substance present, the freezing-point is lowered; also this point is lowered proportionally to the amount of dissolved substance and also to its molecular weight.

Various observers are now using this method to determine the amount of elimination by the kidneys; and in a recent paper, Ogston of Aberdeen has given the sanction of his authority to the reliability of prognostic and diagnostic opinions based on this fact.

Similarly, as the constitution of the c.s. fluid varies in morbid states, so does the freezing-point alter; and numerous researches, chiefly by Widal, Sicard and Ravault have been directed to this study. The apparatus used is that devised by Beckman. It appears that in tubercular meningitis the c.s. fluid freezes at a lower temperature, viz., 0.4 degrees below zero.

In acute meningitis of other types it varies considerably, so that the observations of these writers lead us to believe that whilst a lowered freezing-point indicates a meningitis, it does not afford sufficient evidence for the diagnosis of the variety.

(2) *Altered permeability of the meninges.*—Griffon and Brécy have shown that potassium iodide, which nominally does not pass into the c.s. fluid, may be detected in the types of c.s. meningitis which are not tubercular.

(3) *Abnormal organic constituents.*—

(*a*) Albumin.—A considerable amount of this substance may be detected in inflammatory conditions, and recently I mentioned a case of tumor of the brain in which the c.s. fluid, though quite clear and without any cellular elements, contained a considerable amount of albumin.

(*b*) Choline.—Mott and Halliburton have shown that this body, though present in very small quantities in the normal fluid, is greatly increased in degenerative diseases of the nervous system, such as general paralysis and epilepsy. It can readily be recognized, and may form a test in obscure cases, especially perhaps in distinguishing disseminated sclerosis from functional disease, which it so often simulates. Dr. Mott has recently, at the annual meeting of the British Medical Association, laid stress on this point.

(c) Other toxic substances have also been found.

(4) *Microorganisms.*—The presence of certain microorganisms, when demonstrated, would be conclusive evidence as to the nature of the morbid state.

The fluid should be centrifugalized, and an inoculation experiment may be necessary.

Of all, it appears that tubercle bacillus, the most important, is also the most difficult to find. The *Diplococcus intracellularis* of Weichselbaum, and the cause of many sporadic and the epidemic type of meningitis, has frequently been found.

(5) *The cytology or nature of the cell elements present.*—From a practical point of view, this would seem to be the most important.

There has been much discussion and a greater diversity of opinion as to the significance of the appearance of the various kinds of cells.

It is obvious that if there is an inflammatory process going on in the cerebral meninges, and if the communication between the cerebral ventricles and the spinal canal is open, that microscopical examination of the fluid withdrawn by lumbar puncture must be important. I have no doubt that we have here something of considerable value; the difficulty is in the interpretation thereof.

In the first place, a fair number of the ordinary multinuclear type of cell may, I think, be taken as very great evidence that there is an acute meningeal inflammation present.

Observations have shown that they are not found in pneumonia, rheumatism or typhoid, with symptoms simulating meningitis, unless there is an actual organic lesion of that nature, nor are they found in those diseases of the nervous system, such as general paralysis and tabes, unless associated with chronic meningeal changes. In a positive and negative sense, therefore, an examination directed to this end is useful. It is different, however, with regard to the presence of lymphocytes. Widal has strongly insisted that in a suspected case they are evidence of the tubercular nature of the disease, and many others also consider the preponderance of one type or the other of most important diagnostic significance.

More observations are, however, yet needed. Lymphocytes have been found in the fluid in cases of cerebral tumor, in general paralysis, and in disseminated sclerosis, and in some of the specific fevers, as typhoid and pneumonia, where meningitis does not exist.

Abstracts of three illustrative cases.

1. G. A., a well-nourished child of eight months old. On admission there was marked retraction of head and neck, constant crying and vomiting. Evening temperature 101 degrees; pulse 126. No squint, no forms of paralysis, optic discs normal. A provisional diagnosis of meningitis was made. Lumbar puncture yielded a slightly cloudy fluid, containing flakes of lymph. The centrifugalized deposit showed a considerable number of cell elements, chiefly of the type of the multinuclear form, a few lymphocytes present. No microorganisms recognized, and tubes of serum, gelatine and agar remained sterile. A white mouse and rabbit inoculated remained healthy. The child gradually wasted, vomiting and oocasional fever persisted. Lumbar puncture was performed several times, and it may be stated that after each operation a temporary improvement followed. This improvement finally became maintained, and the child was discharged from hospital in three months after admission, free from any acute symptoms. The fluid removed by the puncture gradually became clearer, and the multinuclear forms were replaced by lymphocytes. In this case the character of the c.s. indicated a more favorable prognosis.

2. A. M., child aged sixteen months, well up to a few days ago, then became feverish and irritable. On admission there was marked retraction of head and neck, and almost opisthotonos, the lower limbs were rigidly flexed, and Kernig's sign was present. Temperature of an irregular type, the maximum evening rise reaching 102 degrees; pulse was usually about 100. A nasal puru-

lent discharge was present. Lumbar puncture obtained a turbid fluid, containing some masses of pus. The multinuclear type of cell greatly predominated, and beautiful specimens of the *Diplococcus intracellularis* of Weichselbaum were found. The diagnosis was therefore fully established. Death occurred ten days after admission, and the characteristic purulent meningitis associated with the organisms found.

3. J. O., child eight months old, said to have been quite well a few days ago, then became "feverish," and vomited several times; convulsions occurred soon after. On admission, child lay in bed in a drowsy condition, limbs rigidly flexed, fontanelles tense and prominent.

Lumbar puncture provided a turbid fluid, in which numerous multinuclear leucocytes were found, and from which also a pure cultivation of *Staphylococcus albus* was obtained. A white mouse inoculated with the fluid died from a staphylococcic infection in fourteen days. The child survived only twenty-four hours, and the post-mortem revealed a purulent meningitis.

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These and many other papers are abstracted in the Revue Neurologique.

THE TREATMENT OF INFANTILE SPASTIC PARALYSIS

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I venture to bring before you a subject which for many years has interested me and which until quite recently has so far as treatment is concerned, suffered unmerited neglect. There is something so uninviting and hopeless-looking about a case of cerebral diplegia that a man must possess in addition to a theory of attack, no small fund of enthusiasm before he decides on treatment. Cases of infantile hemiplegia, with half their brain and half their extremities in working condition, offer less obstacles to management if less scope for ingenuity.

It is impossible to enter fully into the subject of cerebral paralysis, but I can indicate certain types which offer adequate reward to surgical endeavor, and point out the remedial methods which in my experience have proved of value.

For the purposes of this paper I would group cases into those of (1) Infantile hemiplegia; (2) Cerebral diplegia; and (3) Spastic paraplegia.

Of 850 cases I have been able to collect from various sources, 510 were hemiplegic; 30 monoplegic; 142 paraplegic; 157 diplegic.

This vast disproportion between the hemiplegic and the other groups is not borne out in my own experience, which favors the preponderance of the diplegic type.

Most generally the hemiplegia is an acquired, not a congenital affection. It usually appears before the fourth year. The onset is very often heralded by convulsions, and in quite a number of cases there are acute febrile symptoms, which are in interesting contrast to the onset of adult hemiplegia.

From the first, the reflexes are exaggerated and the arm and

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[1] Paper read before the Liverpool Medical Society.

limb are powerless. Deformities soon follow. The foot is arched and adducted; the knee is bent; the hip is internally rotated, somewhat adducted, and the femur is bent on the trunk. The arm is huddled to the body, the elbow is flexed to a right angle, the wrist is dropped, the hand pronated and deviates towards the ulnar side, and the fingers generally grasp the thumb, which lies very forcibly adducted. As in the case of adults, rigidity of the affected muscles comes on in the generality of cases. This rigidity becomes more marked if the limb be moved either passively or by the child, and disappears under an anesthetic. The aphasia so often present is motor in character, and may accompany either left or right hemiplegia. Then follows an inequality of growth. This is more marked in the arm than in the leg; a fact probably accounted for by the difference in nutrition, due to the more frequent exercise of the leg. I have seen the affected arm three inches or more shortened; it is rare to find the leg over an inch shorter than its fellow.

Of chief interest to us from the point of view of treatment are the following facts:—

(*a*) The upper limb is more severely affected than the lower.

(*b*) The lesion of the upper limb is more permanent.

(*c*) The power of dorsiflexion of the hand, with simultaneous extension of the fingers, is lost.

(*d*) That movements are performed without precision, spasmodically and slowly.

(*e*) That the power of adduction of the thumb is often lost.

The disabilities of the lower limb are generally:—

(*a*) Contraction of the knee.

(*b*) Extension of the foot.

(*c*) Internal rotation of the femur with adduction.

(*d*) General rigidity.

The cerebral diplegic group is by far the most serious, as we have here to deal with both arms and feet. Unless the hands can be used, the surgeon is sorely handicapped in any effort he may make to improve the condition of the limb. Clinically, we may divide this group into—

(*a*) Cases with and cases without severe mental complication.

(*b*) Complete and partial disability of hands.

(*c*) Complete or partial disability of limbs.

(*d*) Cases complicated by athetotic movements.

In a number of cases the spasm is confined to the limbs, and this is a group to which we give the name of Little's Disease, or Spastic Paraplegia. Of the vast majority of cases even in this last group a varying degree of mental derangement will be noted, and in many, athetotic movements are present. A typical case of spastic paraplegia brought to the surgeon at the age, say, of twelve months, is characteristic; usually no contractions have occurred at the hip or knee; the child's legs are rigid; the toes are pointed; there is usually no internal rotation, and adduction is not sufficiently severe to cause a crossing of the limbs. The reflexes are exaggerated, the patellar reflex not usually causing a knee-jerk but a leg-jerk. If the little patient be held by its arms there is no endeavor made to separate the limbs; and should the toes be brought to the ground, and an effort made by the child to walk, both limbs move synchronously and in parallel lines. When passive separation of the limb is made, although it is easily effected, one can see and feel the antagonistic efforts of the powerful adductors. If at a later stage the patient is able to walk, several changes will be noted. The adduction will be more marked; the scissors walk will have developed, and a characteristic dragging of one knee round the other will be noted, which becomes more pronounced when any attempt at running is made. The body pressure is mainly transmitted to the ball of the toe. These contractures, however, at this stage, are generally spasmodic, and there is no appreciable shortening in muscle length. This shortening occurs at a still later stage, and is known as contracture.

In quite a number of cases the patients are in a hopeless position as far as walking is concerned. Any effort they make to move only serves to throw the muscles into violent contractions and the legs into extreme adduction. The most severe type of contractions in the legs may be associated with but very slight mental defects, and unaccompanied by diplegia.

Before discussing treatment I will briefly touch upon the pathology of spasmodic paralysis, if only to suggest how futile are operative procedures directed to the primary lesion. The pathological conditions in hemiplegia, paraplegia, and diplegia are the same in kind. The symptoms are due to the retardation of growth, resulting generally from embolism or thrombosis, together with changes in the spinal cord. In later cases one finds wasting and sclerosis of the motor tracts, with often a loss of substance in the form of cavities or cysts, known as porencephalus. These cysts occur on the surface of the brain, and sometimes dip fairly deeply into it. They seem to be a late result in a growing brain, and to have produced an extensive scar substitute for cerebral tissue. Should the porencephalus or sclerosis be unilateral, hemiplegia results. If the scar is bilateral, diplegia or spastic paralysis ensues. The lesions, therefore, are a late product of a hemorrhage, an embolism or a localized encephalitis. In the cord, degenerations of the pyramidal tract or the lateral columns are to be found. Sachs and Peterson have analyzed 73 autopsies and found the following conditions :—

Atrophy, sclerosis and cysts, . . .	40
Hemorrhage, ...	20
Embolism, ...	7
Thrombosis, ...	5
Tubercle, ...	1
	73

Osler, in an examination of 90 brains, found a vascular lesion in 16,—7 due to hemorrhage, 9 to embolism.

The treatment of spastic paralysis has been too long in the hands of the physician for much real progress to have been made. Indeed from medicine in this affection we have nothing to expect apart from very indirect results, and we have only to scan the text-books on neurology to realize the note of pessimism which is sounded. Even Sir William Gowers, in his "Diseases of the Nervous System," says, "The tendo Achillis is sometimes divided for contraction of the calf muscles in infantile spastic paralysis, but the operation is useless and ought never to be performed." The same opinion has been pronounced by other distinguished men, so one can see how surgery has been silenced in the matter. I would argue that a large proportion of children suffering from severe spastic paralysis may be transformed into useful members of the community, improved both in body and mind by surgical methods, enabled to walk with comparatively little deformity, many requiring only the aid to be derived from one or two sticks.

The class of case which we can place outside remedial art is the idiot, the microcephalic, and the violent, irritable type of diplegic, so often seen, subject to fits and active athetotic movements, who has generally lost all control over his secretions. The treatment of any condition short of this may be undertaken with varying success, subject to conditions which obtain in any surgical case requiring prolonged attention. For instance, active treatment may be needed for nearly two years. It would therefore be unwise to admit a case into hospital for two months and then send it to a miserable home, where neglect would be the inevitable sequence. Such a case, however, after hospital treatment, secure in the care of anxious intelligent parents, no matter how poor, would prove a credit to all concerned. These are important matters which the surgeon must consider before he undertakes his work. Another class which gives the greatest anxiety and trouble is that where the affection of the hands is of such a kind as to promise but slight hope of their assistance to the limbs during walking. Before despairing, however, I think it is well to give such hands the opportunity of a careful trial, both as a mental discipline and because success sometimes exceeds expectation.

I would divide the treatment of all cases of spastic paralysis into operative and post-operative; for although mechanism is involved in nearly every case, there is hardly a case which we are called upon to treat without invoking operative aid.

Infantile hemiplegia usually affects the arm much more than it does the leg. This is almost invariably the case, and in this particular it differs from diplegia, where, when the four limbs are attacked, the hands are frequently less severely affected than the limbs. Indeed, in hemiplegia the paralysis of the hand is sometimes absolute, and in addition we have a complication in the shape of rigidity. The behavior of the lower limb differs also from that of spastic paraplegia, in that the adductor spasm is proportionately not so marked.

The treatment of the hand and arm in infantile hemiplegia is distinctly less promising than in the diplegic case, but there are clinical signs to which I would draw your attention, which help us to prognose success or failure. If the paralysis is complete, or, in other words, if the little patient is never known to relax his spasm, treatment is futile. If he only moves the fingers of his affected hand in conjunction with the fingers of the opposite side, the results will in all probability be discouraging. In all cases where the parents are able to truly say, in the spirit of true observers, that the patient is able to do more with the hand than he was a little while ago, the success of treatment is assured. Similarly, where any degree of voluntary relaxation of spasm exists apart from an associated movement on the opposite side, treatment is emphatically indicated.

Noting that the dominant deformity in both hand and elbow is pronation and carpal flexion, treatment should consist in fixing the elbow supine and in fully extending the wrist. The full extension of the wrist should be combined with that of the fingers, and a special arrangement adapted to keep the thumb at right angles to the palm. The spasm in these cases is often so pronounced that the extension of the wrist and fingers must be brought about very gradually. If the elbow is affected by contracture of the biceps and brachialis anticus, supination may be combined with extension. If this be not the case, the flexed position of the elbow will suffice. If, instead of being firmly pronated, the elbow lies semiproned, it is not necessary to treat it, and all one's energies should be directed to the hand. It is difficult to give a reason as to how improvement comes about, but it may be taken as an axiom that prolonged fixation of spastic muscles in a position opposed to their contraction lessens the severity of the spasm. This is true wherever spasm may be found, and its influence may be tested even in spasmodic torticollis, intractable as we know that affection to be. It would appear as if the group of muscles at last got tired of trying to pull. This treatment of full extension may be discarded in about twelve months if during the whole of that period it has been kept up without intermission. The test for relaxation must be the power of voluntary movement, however slow it may be. It will be noted that generally at this stage the patient, in endeavoring to extend his wrist, will first of all close his fingers, and will only open them on completion of extension. The process is reversed when the wrist is flexed. In order to meet this difficulty, the splint employed to extend both wrist and fingers is modified so as to extend the wrist alone and allow freedom to the fingers. At this stage, or earlier, the surgeon may decide whether in a given case success may be predicted, and if he is in doubt, operation should unhesitatingly be performed. The operative treatment will consist of tenotomy or tendon transplantation: myotomy need only be mentioned to be avoided. An incision is made over the tendon of the flexor carpi radialis, and both tendons are divided low down and taken, (*a*) the flexor ulnaris to be inserted into the extensor ulnaris, and (*b*) the radial flexor into the radial extensor. I performed this operation for the first time some years ago upon two spastic children whom I showed before the Society for the Study of Diseases in Children, and in both instances voluntary movements were steadily performed, and one, a girl of nine, was able to write quite a respectable hand. At the present time one of the worst cases of athetosis in connection with cerebral diplegia is an inmate of the Liverpool Country Hospital for Chronic Diseases of Children. When he entered the hospital two years ago both limbs were firmly adducted, contracture had occurred, which had so affected the feet that plantar flexion had taken place with almost evulsion of each astragalus and cuboid, the skin of each dorsum being reddened by pressure from within. The hands were firmly flexed and but little voluntary movement existed. Athetotic movements, more resembling chorea, with occasional jerks which almost lifted the patient from his bed, complicated treatment. So far as the hands were concerned, hyperextension such as I have described was practised, and later division of the flexors of the wrist. The little patient has steadily progressed. He can voluntarily move his limbs in all directions; with aid he can take a few strides.

In order to overcome severe spasmodic pronation of the forearm, my friend Mr. Tubby has changed the point of insertion from the front to the back of the radius of the pronator radii teres, thus transforming the muscle into a supinator. The operation has been several times successfully performed.

Tenotomy alone, has proved distinctly disappointing, although one has had an occasional successful case. The operation should be confined to the division of the flexor carpi radialis and ulnaris. It is, in my opinion, better to elongate the other flexors of the hand by a long median incision, such as one would employ in lengthening the tendo Achillis. Tendon transplantation, however, is a better operation, less complicated and more reliable. The surgeon's art, however, does not end with the operation, and over-extension of the wrist leaving the fingers free should be practised for a further few weeks. In order to prevent adhesions after the operation, the wrist should be freely but withal very gently moved in about a fortnight's time. Whether an operation has been performed or no, the final stages of treatment are identical. They should consist in getting both guardian and patient to do all in their power to practise movements from simple to complex. The surgeon must inspire confidence and instil enthusiasm. This cannot be done by a long face which crushes hope, nor by doleful references to a still more doleful pathology. In most cities in England, neurology seems to make the physician a fatalist and one who clothes himself with gloom and pessimism. Of all departments in medicine this is surely the one where the brighter side of things should be kept in the foreground. Failure depends upon men as well as measures, and a thoughtless impatient word of discouragement may paralyze all effort.

The nature of the movements to be practised must be left to the ingenuity of the surgeon. The principles which should govern him may, however, be indicated here:—

(*a*) The movements should be practised slowly and without excitement.

(*b*) They should be made interesting to the child.

(*c*) Those opposed to the direction of deformity should predominate.

(*d*) Those presenting the greatest difficulty should be chiefly practised.

Just a word before we deal with paraplegia regarding tenotomy of the spastic muscle. Empiricism has taught us that, for some reason or another, tenotomy lessens, both in frequency and intensity, the spasmodic element in paraplegia. I do not merely mean to say that division of the tendo Achillis controls spasm in the calf muscles, although of course it does, but rather that spasm in which those muscles are not directly concerned is also influenced. This is beyond all question, and must have been noted by everybody who has had the opportunity of observing, and the fact has now reached the robust stage when physiological explanations are vouchsafed.

Whitman urges that by elongation of the tendon the response to the exaggerated motor impulses is lessened, and an opportunity for more effective control is afforded.

Mr. Tubby has propounded the theory that once the immediate pathological effect of the central nervous lesion has subsided, the spinal cord remains in a state of undue reflex excitability. A tightly contracted muscle and tendon tend to augment this condition, and so induce in themselves further contractions. In other words, there is a vicious circle of reflex action which can be interrupted by section of the tendon, and diminution in the tension of the affected muscle and tendon.

Lorenz attributes the good effect to the shortening of the bellies of the tenotomized muscles, so that their range of action is diminished. Both these theories refer of course to spasm with which the divided muscle is concerned, and do not explain the diminution in spasm experienced elsewhere. We must further remember that the opponents of contracted muscles are always elongated and weak, and that the rest afforded them by tenotomies, by relieving them of strain, helps to restore muscular equilibrium.

The practical deduction from these observations is, that no opportunity should be lost of performing a tenotomy. Even in mild cases, where a spastic tendon is to be felt, let us ruthlessly divide it.

If the surgeon has decided that a case of spastic paraplegia is suitable for treatment, a splint should be prepared, so designed as to keep the limbs in marked abduction. The area over the hamstrings, the adductors at the groin, and the tendo Achillis should be prepared for operation. The adductors should be first attacked. An incision an inch and a half long should be made to the inside of the adductor longus. This muscle should be seized by a Spencer Wells or a small open forceps, and about three-quarters of an inch of it removed. The limb is then abducted, and portions of the adductor brevis and gracilis are exsected in similar fashion. The horizontal portion of the adductor magnus, and if necessary the pectineus, is divided, and also any tissue, muscular or fibrous, obstructive to an absolutely free abduction of the femur. Experience has shown me that although the chief offenders are the adductors longus and brevis, nevertheless the deeper muscles often require division. To anyone who has practised this operation, the futility of attempts to effectively divide the muscles subcutaneously will be apparent. Division is followed with but little hemorrhage, and the wounds are closed without drainage. Having exsected the pieces of the adductors, each tendo Achillis is divided or lengthened, and rectangular splints are applied to the foot. The limbs are then well abducted, and the surgeon notes whether there is any obstacle to easy extension of the knees. If there should be (it is not often the case), an open incision must be made on each side of the popliteal space, and the tense hamstrings are in turn divided. If these incisions are long enough, the fascial contraction can be attacked on either side, for it is here that opposition is often found. I would discourage the use of a transverse incision, as when adopted it often seriously hampers the surgeon's efforts to fully extend the knee by reason of the strain cast upon the sutures. In 1885, when I was at the Stanley Hospital, there used to be an adult diplegic in a perambulator always at the gates, and on two or three occasions I took him in to try to straighten his contracted limbs. On one occasion I removed about an inch from each of the hamstrings, but he was mentally so deranged that we did not do each other any credit. I mention the fact, however, because Lorenz of Vienna has quite recently written on the advantages of exsecting portions of the hamstrings.

We have now presumably got our patient comfortably stretched upon an abduction frame, and we must keep him there for at least three months. Usually the wounds heal rapidly. Suppuration has occurred in the adductor cavity on three occasions only, despite the insanitary position of the wounds and the difficulty in adequately controlling the secretions. In 1890 I operated on twenty-seven patients, and this may be taken as a fair index of my yearly return.

At the end of three months the splint is taken off during the day and movements sedulously practised. For some weeks stiffness exists, and often the movements are at first painful, but after a time, always shortened by vigorous exercise, the pain disappears and the effort must be made to walk.

The splints are of a simple kind, designed to keep the knee from bending. The boots should be made of felt with substantial soles. The nurse should be instructed to keep both boots and splints upon the patient day and night, and for the first two weeks, frequently during the day, abduction, adduction, flexion, and extension of the hip should be practised. This should be done with and without resistance. At night-time the feet should be attached to the side of the bed in order to maintain abduction. After the first few days of this later stage of treatment the splints should be removed twice a day and the muscles well massaged, and both active and passive movements of ankles, toes, knees and hips encouraged. Any movement executed in a jerky style should be practised until perfected.

The little patient may now try to walk. It will be noted that one of the difficulties of an untreated spastic when he tries to walk is the narrowing of the pedestal upon which the trunk rests by reason of the adducted limbs. Operation has now overcome this, and with abducted limbs the body is poised upon a widened pedestal. During early training the nurse must see that while walking the limbs do not approximate, and that, from the first, swinging of the limbs must be prohibited. Crutches should not be allowed until the patient has been taught to stand unsupported. I need not enter into any more detail regarding this most important stage of treatment, but would add that it affords an inexhaustible field for ingenuity, and that upon the intelligence and industry of the nurse very much depends.

Diplegic hands are treated on the same principles as I have enunciated in regard to infantile hemiplegia, and they must be trained to hold sticks and crutches with a firm unyielding grip. I cannot now deal with individual cases, but I may say I have operated on cases from twelve months to twenty years of age. A large number of these were so bad that they had never attempted to place one foot before the other. Some were structurally flexed (contractured) at ankle, knee and hip. A most helpless youth of twenty, one limb across the other, was able in six months to stand erect and walk with two sticks, and twelve months later could move his limbs north, south, east and west, with hardly an appreciable jerk. Success in an ancient case, where so much has to be unlearnt, and where the mechanical stage offers such difficulty, proves the accuracy and efficacy of the principles I have endeavored to expound. It is logical to infer that if old neglected cases are amenable to surgical education, our prognosis should not be dismal in the young.

With regard to the degree of benefit to be derived from treatment, the parents should be given to understand that under favorable conditions of nursing and tuition the child, aided by the hand or sticks, will be able to walk varying distances in from twelve months to two years, and that with perfectly straight limbs and heels on *terra firma*. A large proportion of cases will later on manage aided by one stick. Even in the least successful cases, parents, mostly having despaired, are full of gratitude. The mental condition of the children obviously improves when their physical defects are remedied and they are enabled to mix with their little friends. Complete recovery in spastic paraplegia is of course impossible.

It will be gathered from my remarks that I wish to urge that the treatment of spastic paralysis should resolve itself into a system. Such a system involves operative, mechanical and educational stages. The treatment cannot be separated into parts. If the surgeon is not satisfied that the case is to be under his control for twelve months, he will consult his reputation best by leaving it alone. Operations not followed up by careful and prolonged aftercare give rise to disappointment and discredit. Merely dividing tendons, to be followed by massage and electricity, is futile and dispiriting.

At the new Liverpool Country Hospital for Chronic Diseases of Children at Heswall, which we intend to build for 200 patients, we hope to have a ward for these paralytic cases, where we can keep them as long as needed. The nurses will be specially trained, and no opportunities will be lost from ignorance or neglect. The three months' time limit which general hospitals impose materially blights the prospects of paralytic subjects. They are neglected at home, and wander from one institution to another, often the victims of conflicting theory and diverse practice. The successful hospital management of infantile paralysis is not complete unless an organized system of education be inaugurated. This in the case of spastics must often be of the visual as opposed to the abstract type. Apart from its direct influence in improving the mind, we find it to have a sedative influence on the irritable. I have often thought that if there were scholastic institutes for the care of the paralytic children of the well-to-do, an undesirable gap would be filled. With cheerful surroundings, these little ones would enjoy in happy combination a development of both mind and body, under the scientific auspices of specially trained instructors. Such advantages would render material aid to many helpless little cripples. As it is, treatment is often halfhearted, rarely continuous, entered into with misgivings on the part of the surgeon and despair on the part of the patient's friends.

PHILADELPHIA PEDIATRIC SOCIETY

Stated Meeting, Tuesday, December 9, 1902.

Samuel McClintock Hamill, M.D., Chairman.

Peribronchitis and Interstitial Pneumonia.—Dr. Abraham Jacobi of New York addressed the society on this subject.

Dr. J. P. Crozier Griffith said that he had had many opportunities of listening to Dr. Jacobi, and had never failed to learn something. He confessed that either he had never seen the distinctly primary and milder cases that Dr. Jacobi had described, or that he had failed to recognize them as being of the character that Dr. Jacobi considers them to be. He had, however, seen cases that he now recognizes as resembling some of those described by Dr. Jacobi. These gave a strong suggestion of being tuberculous, but recovered entirely. There were no positive indications that the condition had been tuberculosis. Dr. Griffith mentioned the case of a child, in which there were symptoms indicating probable apical tuberculosis and in which there were physical signs of cavity-formation, but in which entire recovery took place and in which the whole later course was such as to indicate that it probably was not tuberculosis. This case, he thought, would conform closely to Dr. Jacobi's description of primary apical interstitial pneumonia.

The variety that Dr. Jacobi has classed as degenerative Dr. Griffith has seen more frequently. These cases are most commonly considered at first to be bronchitis or pneumonia. The condition persists, however, and does not soon show signs of improvement. This state of things may last for months. The danger of error in such cases is in the tendency to call them tuberculous, as soon as it is evident that the condition is chronic. Dr. Griffith referred to a case that was at first thought to be ordinary croupous pneumonia, but that was peculiar in the fact that the physical signs developed very slowly. Apparently this child got entirely well and was up and running about. About five months afterward, however, although symptoms of pulmonary disease were absent, the child was examined merely to see whether all the physical signs had completely disappeared. To his great surprise, Dr. Griffith then discovered the evidences of entire consolidation of the greater part of one lung. It seemed at first as if this must be tuberculosis. After some months more, however, the child made a complete recovery.

The speaker had also seen the other class of cases to which Dr. Jacobi had referred, in which there are no definite symptoms of pulmonary disease, but in which the patients show indefinite evidences of ill health, usually accompanied with slight fever; and in which a physical examination brings to light slight pulmonary changes. These cases are especially likely to be thought to be tuberculous; but they not infrequently progress to entire recovery, and, in such circumstances, seem to be nontuberculous. Of course, the question must arise, and must often remain undecided, whether the case is, after all, not one of healed tuberculosis. The speaker had seen some instances that indicated that this was the case. The point of greatest importance referred to by Dr. Jacobi, and the one in which Dr. Griffith wished to agree with him entirely, was that interstitial changes in the lung do not always mean either tuberculosis or syphilis.

Anatomy, Pathology and Clinical Observation.—Dr. Stengel said that in the conception of pulmonary conditions the clinician has come somewhat under the ban of the pathologist, and has surrendered certain of his older beliefs. The pathologist, however, has in his turn set up certain dicta that are not always as reliable as might be desired. For example, in the case of small fibrous nodules, or of larger indurations or puckerings of the apices, the pathologist claims a healed tuberculosis, without special evidence that this is always true. It might well be that such lesions could result from syphilitic processes or from simple, non-specific inflammation—perhaps, at times, of the subchronic type described by Dr. Jacobi. The speaker himself has always looked upon interstitial pneumonia as a secondary, and not a primary disease, excluding, of course, the white pneumonia of infants and the perivascular and peribronchial syphilitic pneumonias of later life. Dr. Stengel said that Dr. Jacobi had called attention to certain physical peculiarities that every physician would at once recognize as not infrequent, and that Dr. Jacobi regards as the result of a slowly progressive, fibrous change in the lungs. These physical peculiarities, mainly characterized by thoracic deformity and contraction of the lungs, are commonly looked upon as evidences of a phthisical habit or a maldevelopment of the chest; and the thought suggested by Dr. Jacobi, that these conditions are, on the contrary, the results of progressive disease, is new. That there are cases of indurative change in the apices, suggesting tuberculosis by their physical signs, and yet not tuberculous in character, was shown by one of the speaker's Philadelphia Hospital patients, in whom the degenerative type of change, as Dr. Jacobi uses this term, was present. There were marked signs of cavity-formation and numerous râles. Tubercle bacilli were repeatedly looked for, but were not found. The patient was finally put under treatment with potassium iodid, after which all signs disappeared. Dr. Stengel has also seen other cases in which there were signs very suggestive of tuberculosis, but in which the later course of the disease rendered this diagnosis untenable. He recalled cases in which there were no signs of tuberculosis except local retractions of the chest. These have sometimes been called healed tuberculosis, but it may be possible that some of them are due to chronic interstitial pneumonia. The difficulty is always in determining whether or not a primary pneumonia of some other type has preceded the interstitial changes. Secondary interstitial pneumonia following ordinary pneumonia is, of course, well recognized. The two cases of distinctly primary interstitial pneumonia that Dr. Stengel had seen post-mortem were both syphilitic.

Dr. J. Madison Taylor asked Dr. Jacobi whether he would be kind enough to state the peculiarities of the respiratory sounds in the condition that he had discussed.

Dr. Jacobi, in reply to Dr. Taylor, said that one must discriminate between uncomplicated cases of primary interstitial pneumonia and those in which bronchitis, croupous pneumonia, or other conditions are present, in addition to interstitial change. In the primary cases, there is, in the early stages, simply exaggerated puerile breathing, with few or no râles; but when the hyperplasia increases, the breath-sounds become reduced in intensity. When, however, atrophy and hardening of the lung begin to become at all pronounced, the breath-sounds tend to become bronchial; and the bronchial quality grows more intense as the induration and contraction of the growth of connective tissue in the lung increases. Finally, in the extreme cases, the breath-sounds become distinctly bronchial.

In closing, Dr. Jacobi said that he merely wished to repeat one statement: Most of these cases are seen in adults, but in nearly all instances the disease has begun in infancy. The physical signs, then, are acquired very early in childhood, but they persist. He very frequently sees adults that exhibit some flatness of the chest about the apex, usually on the right; a dull percussion-note; bronchial breath-sounds; bronchophony; and the other signs of consolidation—for instance, prolonged expiration. It is exceedingly important to distinguish these cases from those of tuberculosis. There is a great tendency to order them off at once to another climate, because of their being considered to be tuberculous; and the speaker has constantly known this advice to be given. In these cases, however, the disease is neither an active nor a dormant tuberculosis; it is a condition that is stationary and is without danger. The important points that distinguish it from tuberculosis are the fact that there are no râles, that there is no cough nor history of cough, and that the signs are found to be absolutely stationary on repeated examinations. Dr. Jacobi emphasized the fact that he sees this condition frequently and is often obliged to determine the nature of these cases. He calls the condition chronic interstitial pneumonia, and not old tuberculosis.

NEW YORK ACADEMY OF MEDICINE

SECTION ON ORTHOPEDIC SURGERY

Meeting of December 19, 1902.

Reception Given to Prof. Adolf Lorenz, of Vienna.—The President of the Academy, Dr. Robt. F. Weir, called the meeting to order and delivered a brief address, then turned the meeting over to Dr. George R. Elliott, Chairman of the Section.

Dr. Weir remarked that an introduction of Prof. Lorenz was almost superfluous, as he was well known, not only in his own department, but in advanced science generally; that his demonstrations of his methods in this country were of educational value to the American physician as well as of great benefit to the special department of orthopedic surgery. The opportunity of actually seeing Dr. Lorenz at work offered a chance of learning altogether different from and in advance of simply reading about his methods, as object teaching is a superior educational method. His special peculiarities were observed in a way not revealed from his writings.

Dr. George R. Elliott said, as Chairman of the Section of Orthopedic Surgery, it was a great pleasure to give expression to the honor the Section felt in having Prof. Lorenz present. It was also a great personal satisfaction to know that his work had received some of the recognition it deserved. From medical men much had been said about the great force used. It was true that Prof. Lorenz was a very strong man, but those who had seen him operate must have observed that the essential element in his operations was the intelligent direction of that force, graduating it to overcome the resistance of the contractured tissues, so that they were reduced to a state of flaccidity. Dr. Elliott further said that six years ago he reported his first case of congenital dislocation of the hip successfully treated by the Lorenz method, and in the report made the following statement: "The operation which we have just considered is a real advance in surgery and, throwing all enthusiasm aside, I feel convinced that it will soon be performed with strikingly good results in all civilized parts of the world." It was unnecessary to say how that prediction had been fulfilled.

Dr. Elliott then called upon Prof. Lorenz to address the meeting.

Address of Prof. Lorenz.—"I consider it a great honor to be allowed to appear before you, and I know of no better way to show my gratitude than by asking your permission to explain to you some of my principles which hitherto have ruled my orthopedic work.

"I hope to meet your approval at least regarding some of these principles; as to others which may rouse your opposition for the moment, I hope you will find them worthy of your objective trial. Even if these principles do prove to be different from yours, certainly we who are on both sides of the Atlantic which divides the places of our work, completely agree on the same aim, that is, to help our patients in the best way. As to my methods, I can recommend them as both safe and successful to the patient. In saying this, I touch upon my leading principle, that is, curing my patients without danger of loss of life. Luckily deformities seldom offer what we call indicatio vitalis, therefore, when we operate on deformities we should never arouse even the possibility of putting the life of our patient in danger. Following this principle, I generally prefer bloodless operations to the bloody ones. Usually the results are the same, but in many cases those of the bloodless ones are even better. As long as the bones are elastic enough, I prefer osteoclasis to osteotomy; this latter operation is exclusively reserved for adolescents and adults. In hip deformities I prefer bloodless corrections to osteotomy as long as even the slightest motility of the joint can be stated; only in cases of complete bony ankylosis do I operate with the chisel.

"All cases of knee contracture I correct by the intra-articular modeling redressment as long as even the slightest motility can be found. Only cases of complete bony ankylosis of the knee-joint, which are rarer than is usually believed, are reserved for the bloody operation.

"In all deformities of the foot, both paralytic and congenital, I rely exclusively upon my modeling redressment of the foot, and from a thousandfold experience I can assure you that the results are generally beyond expectation. In my opinion the wedge-shaped excision of the bones of the foot newly recommended by the French, is nothing more than a deplorable mutilation of the foot. The results of the modeling redressment of club foot have been preferred by many others and I am happy to say that at least in Germany this method is predominant.

"On the whole, I daresay that I prefer bloodless operations to the bloody ones as long as any possibility exists of securing the result in this way. According to this principle, I cannot sympathize with the total extirpation of the sterno-cleido-mastoideus in wryneck. After my experiences the subcutaneous myotomy of this muscle in connection with the modeling redressment of the cervical skoliosis is perfectly sufficient to cure the *caput obstipum* thoroughly and without leaving a scar. In this realm I go even further, as the congenital *caput obstipum* in children can be cured even without tenotomy, only by myorrhexis of the sterno-cleidomastoid muscle, and the results obtained by this method are the most perfect ones from a cosmetical standpoint. The ruptured muscle regains its normal length as well as its normal elasticity to such a degree as to allow the head to move freely to the opposite side. Besides this, the ruptured muscle retains a normal prominence with its partner, restoring the normal configuration of the neck, in this way avoiding the known applanation of the operated side which usually occurs after open or subcutaneous myotomy.

"Following this principle you will share many advantages with your patient. The latter readily consents to be operated upon as he runs no risk of life, and as for yourself, you will feel quite easy about him.

"Another principle which I have always followed is the so-called central correction of deformities, which means that every deformity should be corrected in the vertex of its angle. If you should prefer to correct a deformity in one of the sides of the angle, even near the vertex, the deformity itself would remain and instead of a correction you would have only a compensation for the deformity. This compensation implies some shortening of the side of the angle, that means of the leg, which shortening should be avoided under all circumstances. This principle is very important with regard to the contractures of the hip-joint. It is obvious that subtrochanteric osteotomy contradicts the above-mentioned principle. By correcting or compensating the deformity you shorten the leg. Agreeing with the principle of central correction, I always do central, that is, pelvotrochanteric osteotomy. Having performed this operation, correction is very easy without causing any further shortening of the leg. I object even to oblique subtrochanteric osteotomy, although it avoids shortening by a complicated and difficult extension after treatment by which the patient is confined for some weeks to his bed instead of being able to get up a few days after the operation.

"Following the principle of central correction you will also object to supracondylic osteotomy or osteoclasis in correcting the contractures of the knee-joint. In preferring central, that is, intra-articular correction, you will avoid shortening the limb. In correcting genu valgum the principle of central, that is to say, intra-articular correction cannot be thoroughly attended to because —except in cases of young children—a loose knee is to be feared, and besides the treatment takes too much time. In genu valgum supra-condyloid osteotomy is still the predominant method because of its general reliability, but beyond doubt epiphysiolysis on the lower end of the femur allows better correction of the deformity, being a more central method than the supracondylic osteotomy. Unfortunately the method of epihysiolysis is available only in children from five to sixteen years.

"Another important principle of modern orthopedic surgery is that of absolutely saving the bones by dividing the soft parts as far as circumstances may demand it. This conservatism toward the bones and this radicalism against the soft parts (just the inversion of a principle of former times) condemns all cuneiform osteotomies and resections en bloc, of the bones, and makes it a rule to correct deformities by simple linear osteotomy, sacrificing the soft parts as far as may be desirable. Indeed it is very easy to correct every hip deformity of whatsoever degree by similar linear (pelvitrochanteric) or central osteotomy, after having thoroughly divided the adductors and the subspinal soft parts. It is of no importance whether you divide them in open wound or subcutaneously, you must only divide them thoroughly. The wedge-shaped excisions of bones in correcting knee contractures are likewise to be avoided, or at least to be restrained to a minimum by regardless radicalism against the soft parts in the fossa poplitea. As to the excisions of bones in the treatment of clubfoot, I have mentioned above, I abhor them.

"The principle to correct deformities only by simple linear osteotomy, is even available in those most difficult cases of bowlegs with anterior convexity of the bones. In such cases I apply one or two linear osteotomies to the center of the deformity, then I add Achillotenotomy and sharp screw extension above the ankles until correction is allowed.

"Another principle of common interest refers to the treatment of tubercular diseases of the joints in children, and to the treatment of deformed paralytic limbs. I must avoid discussing the question whether operative or conservative treatment should be carried on in these cases. My standpoint on this question is rather one of expectancy. But I do not hesitate to declare that up to now I have never made a resection of a tubercular joint in children, and that the results of conservative treatment seem to me far better than those of operative treatment. Nevertheless I am far from denying the necessity of operating in some special cases, particularly in common hospital practice. However, the principle of which I will speak refers to the question whether or not mechanical treatment should be carried on in a way to exclude all functional work of the limb during the whole treatment. Observation of nature let alone seems to me to give the answer to this question. If we contemplate a case of hip disease never interfered with by any treatment at all, we learn in many cases that nature unhelped by our mechanical means, needs no more time to cure the disease than we do. After some two or three years all may be over. During this time the sick child may have been confined to bed by great pains in the hip-joint some months only. During the rest of the time they walk about without the help of crutches as well as they can, using the limb according to the actual state of sensitiveness. After all the disease heals without any suppuration even, and finally we see these children come to us to get rid of their deformity. We find a contractured limb, but fit for function even under the unfavorable mechanical conditions of the deformity. We find the bones solid and the soft parts not so much wasted as we expected; and last but not least, we find that the growth of the limb has not been much interfered with by the disease. These cases are the best objects for operative treatment because the good state of the legs very soon enables them to profit by the correction of the deformity. If we compare one of these cases of natural healing to the results of our mechanical treatment, which may have begun at the first sign of the disease, we will find that we have scarcely shortened the course of the disease. We accomplish that pains have been loosened or suppressed, and that the limb may be in a tolerably good position. But surely we shall find the leg in a wasted condition, the muscles being slack, the bones lacking solidity, being quite unable to support the weight of the body, although pains have long since disappeared. Probably we shall find besides that the growth of the leg has been much interfered with by the disease. There can be no doubt that this deplorable condition of the limb is due to the fact that both by suspension and fixation by our mechanical means the leg has been totally excluded for many years from every function of movement and weight carrying. From this consideration is derived my principle to exclude the diseased limb no longer from a measured function if severe pains will not forbid it. I never allow any movement of the diseased joint, but I suspend the weight only as long as the pains demand it, always taking proper care to procure slight abduction of the leg. As soon as the pains allow it I begin to attend to the muscles by massage. Of the movements, only active and passive abductions are made in the later after-treatment to prevent the tendency to abduction.

"My final aim is to procure a solid ankylosis of the hip-joint combined with good position of the leg, experience having taught me that great mobility and bad function with lack of any endurance are common allies. With greatest enthusiasm I would welcome a method which would procure a true bony ankylosis of the diseased hip-joint, bony ankylosis of the hip and good position of the leg being the condition for the best result both from a cosmetical and functional point of view.

"As you may have seen by what I have said, I make little of the permanent extension. I consider extension only a matter of fixation; direct and indirect fixation together naturally give a greater degree of surety. I have said that every articulation attacked by chronic diseases should not be prevented from function any longer than is absolutely necessary. In saying so I turn against the method of treatment generally used in Germany, which makes the patients wear their pressure relieving and fixing apparatus so long that they become slaves to them. This same principle I emphasize using in the treatment of paralytic deformities. I am convinced we render no great service to our patients by making them wholly dependent upon their apparatus; the limbs atrophy by exaggerated use of apparatus to such a degree that they become useless for any function. It is my practice to correct thoroughly the paralytic deformities by modeling redressment, in case of need combining the transplantations of the tendons, and to fortify the rest of the muscles by massage and exercises in order to secure the obtained correction. For the rest, the patients must be accustomed to make use of their legs as much as possible without apparatus, or by assistance of the simplest one. Generally a flannel bandage or laced boot will give the necessary support. In any case I take care to secure the corrected position during the night by means of a simple apparatus. I think that enclosing the leg in a steel support is to be avoided, as by so doing the leg will be excluded from any function. On the contrary, I try to make the leg independent of mechanical appliances as far as possible. Only in the treatment of total paralysis, which fortunately occurs rather seldom, the permanent use of mechanical support is indispensable. In the treatment of skoliosis I am wholly against the exclusive application of mechanical supports, especially against those which are worn day and night. I restrict the use of corsets to special cases which evidently want a support. Besides I take special care of the muscles of the back by exercising them, and endorse the necessity of forcible anti-skoliotic gymnastics.

"Gentlemen, I think it unnecessary to follow these principles in detail, and I hope you will not object to my endeavoring to solve the problems of orthopedic surgery by operative treatment, and if possible by a bloodless one, and to restrain and simplify orthopedic appliances.

"If the surgical task has been thoroughly solved, orthopedic appliances, if necessary, may be of very simple construction so that special mechanical ateliers may be considered superfluous. If orthopedic surgery conceives and carries out its themes in such a way, then it will be possible to indulge in orthopedic surgery at every surgical station, even if great mechanical means may not be at hand. Then orthopedic surgery will not deny its democratic character, which it must have to be able to communicate its progress and improvements to even the poorest children who may be in want of relief."

Dr. V. P. Gibney said that he would like to tell the Fellows of the Academy of Medicine just how much he had learned from Prof. Lorenz. He said: "All this information given us this evening about bearing weight on the joints, about correcting deformities, about destruction of muscles which produce deformity, especially the adductors, has been something of a revelation. Nearly all the medical men and medical students in this city, during the past week, had the opportunity of witnessing his magnificent demonstrations. At the Hospital for Ruptured and Crippled he gave us his views about the management of hip disease, club foot and wryneck, and while it seemed to me at first they were rather antiquated, when Dr. Lorenz began to elaborate them, I felt that we were in the presence of a master. Many years ago we were taught to believe that the function of orthopedic surgery was to correct deformity. That, he observed, was still the English version, as the London orthopedists, whom he had met, had little to say about the prevention of deformity. Dr. Lorenz said at his clinic in Vienna, he allowed the mother to tell the story, and the mother would speak of the pain, the expression of abscess formation distending the tissues about the hip-joint. We had been able in our hospital work for many years to predict this abscess formation. We find that in most cases a plaster-of-Paris bandage absolutely fitted to the hip, knee and malleolus, extending from the free ribs down to the foot does control pain, and the child from having twenty or more cries at night will have few or none. Sometimes we get a case which does not yield, then we apply light and heavy traction in the line of the deformity. Finally we discover a deep abscess. Lorenz tells us only a confirmation of our own views that the pain in hip disease comes in exacerbations. We do not quite agree with him that it is necessary to give up traction. He employs traction sometimes, but simply for fixation. He further claims that we employ traction for too long a period, that we cause atrophy of muscle and destroy functional activity. His idea is to employ traction over short periods; he does not allow deformity to occur at all. We asked him if he aimed to get functional restoration, to which he replied, 'Yes, five or ten times in a hundred.' All orthopedists, I think, will agree that our aim is to get the hip cured so that we will have perfect restoration of function. There is great room for reflection and whether we are all wrong about traction remains to be seen. Those of you who were present at the Cornell clinic saw his ability to take a virgin clubfoot, an extreme case, and within half an hour he and his able assistant, Dr. Mueller, had 'pulpified' the foot, so to speak, had rendered it 'like a wet rag.' Dr. Lorenz says that age is no deterrent in the bloodless correction of clubfoot, though when the bones cannot be managed by hand he uses instruments for their manipulation. He spoke of a case of a man, aged forty-two years, where he had reduced an extreme equino varus, with perfect restoration. If he has done no more good than to show what can be done in clubfoot he is a great benefactor to the profession and to the public."

Dr. Royal Whitman said he had been especially interested in Dr. Lorenz's contention that the anterior displacements—so-called transpositions—that so often followed bloodless operations, were to be classed as incomplete successes, rather than failures, as he had considered them. Recognizing, as he did, that the function in these cases was often greatly improved, he should now be encouraged to persist in maintaining the limb in an attitude of abduction and extension, even when it was evident that anatomical reposition had failed. The result was to be expected in older subjects, and Dr. Lorenz even operated with the aim of simply transposing the head of the femur for the purpose of lengthening the limb and improving its functional ability. This treatment, which might be applied in adolescence, or even later, seemed to him a very important advance. Another outcome of this line of work was its application to disabled hip-joints in adults, as Lorenz had advocated recently. To illustrate: He had that afternoon seen a patient who had sustained a fracture of the neck of the femur one year ago. There was non-union, two inches of shortening, and the weak limb was used with the aid of crutches in an attitude of adduction and flexion. He had been able to assure the patient that if under anesthesia the limb were forced into extreme extension and moderate abduction (thus forcing the upper extremity of the femur forward beneath the anterior superior spine) and were fixed in this attitude by a Lorenz spica he would be able to discard his crutches and that his discomfort and pain would be relieved. He had this confidence because the treatment was based on correct principles and because he had already applied it in a modified form in other cases.

Dr. Reginald Sayre remarked that he voiced the sentiments of all orthopedic surgeons in saying that much had been learned during Dr. Lorenz's visit. After having seen him operate we realized exactly what he did in a way we could not do from reading of his work and methods. He referred to the amount of force which we had seen could be used on the soft parts and thought this could not be realized unless seen. He thought that many who had seen Dr. Lorenz operate realized for the first time that eight to ten months were necessary to retain the parts in position and thought this had a fundamental bearing on Dr. Lorenz's success. The reduction was simply one step in the operation. It was not until he had seen him operate abroad that he understood clearly the amount of strength that should be exerted and realized that his own failures had been due to insufficient force and too short a period of retention in plaster-of-Paris.

Dr. Henry Ling Taylor said the visit of Prof. Lorenz had been the most notable as well as the most picturesque event in the history of orthopedists in America. His procedures had been worked out with little regard for conventional practice, but with astonishing simplicity, directness and thoroughness, and he could not help feeling that his demonstrations would have a profound, lasting and happy effect on American practice. Personally he considered it a rare privilege to have known him and to have seen his work.

Dr. Newton M. Shaffer said he thought Dr. Lorenz had done a great deal for orthopedic surgery. Remembering the days of the elder Sayre, Taylor and Knight, and that America might be called the birthplace of orthopedic surgery, yet there had come to us from abroad a great teacher and one who had taught us. He remarked that many had seen him operate and do what was considered almost impossible. He had, at his clinic, presented to Dr. Lorenz a stubborn, resistant case of congenital clubfoot, expecting to see the doctor refuse to operate; nothing of the kind occurred, Dr. Lorenz corrected the deformity, as a matter of course. He said that the Lorenz clinic in Vienna had become the Mecca for orthopedists and that yearly Americans were flocking over there.

Dr. Weir, president of the Academy, proposed a resolution that a vote of thanks be offered Dr. Lorenz, which was seconded by Dr. Homer Gibney and unanimously adopted.

The meeting then adjourned and was followed by a reception to Dr. Lorenz.

PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, January 13, 1903.

SAMUEL MCCLINTOCK HAMILL, M.D., Chairman.

ANEURISM OF AORTA.—Dr. Theodore Le Boutillier presented a girl nine years of age, with aneurism of the arch of the aorta. The child's family history was negative. She was said to have had an attack of pertussis when nine days old and another at the age of three years. She had also had rheumatism at four. The symptoms consisted chiefly in vague joint pains, principally in the right wrist, with cough, which was rather brassy in character. Physical examination showed pallor without cyanosis. The superficial veins of the thorax, the face, and the extremities were distended. There was marked pulsation in the vessels of the neck and in the suprasternal notch. A thrill, systolic in time, was present over an area extending an inch and a half from the sternum on each side, beneath the clavicles. Tracheal tug was present. Dulness was found over an area reaching half an inch on each side of the sternum, and beneath the sternum in the first interspace. The cardiac dulness extended from half an inch to the right of the sternum to just beyond the midclavicular line. A loud, rasping systolic murmur was present. It was best heard over the area of dulness, but was transmitted over the chest both anteriorly and posteriorly. This murmur obliterated the first sound. At the mitral area there was both a presystolic and a systolic murmur.

Dr. Le Boutillier showed skiagraphs of a normal thorax and of the thorax of the patient exhibited. The latter showed an abnormally large shadow of the heart, while the shadow in the region of the aorta was very much broader than in the normal case, and extended distinctly beyond both sides of the sternum. The speaker referred to the literature of the subject, and noted the fact that only 58 cases of aneurism have been found in early life; that is, up to the twentieth year.

Dr. J. P. Crozier Griffith said that he is without personal experience in aortic aneurism in children. He referred to Dr. Jacobi's article on various forms of aneurism in early life, in the Transactions of the American Pediatric Society, in which there are, in all, 28 or 29 cases collected from medical literature; and to Dr. Keen's early paper, in which there are also a number.

Referring to the case exhibited, Dr. Griffith said that he feels that the diagnosis of aneurism is certainly the most probable one; and yet that there must be some doubt attached to it, in the absence of absolutely positive symptoms. He recalled very distinctly a case in a girl less than twenty, in which the diagnosis of aneurism seemed beyond question, there being some extremely positive symptoms; yet in which autopsy showed no affection of the aorta whatever, except narrowing and insufficiency at the aortic valve.

It is true that the contrast between the skiagraph of the case exhibited and that of the healthy child is very evident, and that some explanation must be given for the opaque area visible. There is, of course, a question whether this is produced by an aneurism or by some growth, such as enlarged glands, an enlarged thymus, or the like. If one skilled in medical skiagraphy considers the appearance as characteristic of aortic aneurism, then Dr. Griffith feels that the concluding evidence in proof of the existence of this condition has been supplied.

Dr. David Riesman referred to a specimen of sacular aneurism of the ductus arteriosus that had been obtained at autopsy from an infant in the University Hospital. It was, of course, a congenital condition, the true origin of which was not determined.

Dr. Riesman asked whether a fluoroscopic examination had been made in the case presented, as he thought that the results of such an examination would probably have been more distinctive than those of the skiagraph, inasmuch as with the fluoroscope an expansile pulsation might have been observed.

Dr. A. A. Eshner said that it seems to him that the physical signs and the skiagraph indicate the existence of dilatation of the aorta at least, possibly with atheromatous changes, whether or not there is also rupture of one or more of the coats of the vessel.

Dr. McKee said that it seems to him that our accepted methods of diagnosis lead to one conclusion, viz., that the patient has aneurism. Reasoning inductively, the physical signs and symptoms suggest that diagnosis more certainly than they suggest any other; and the process of exclusion leads to the same result. The substernal dulness exhibits a regular outline, and not the irregular area of dulness that one finds with sarcoma or other conditions involving the mediastinal lymph-glands. The skiagraph also shows a regular shadow, much larger than that seen in the X-ray picture of the normal child's thorax, and corresponding accurately with the position of the transverse portion of the aortic arch.

Dr. McKee does not think that the mere fact that the condition is rare should deter one from making the diagnosis; it should simply make one cautious.

Dr. Edsall said that one condition that can produce the physical signs present had not been mentioned, and he thought that this should be seriously considered in the diagnosis. This condition is a mediastinal pericarditis. There is no difficulty in explaining by this diagnosis all the physical signs present, except, perhaps, the conditions in the skiagraph. Even the skiagraphic picture he thought could be furnished by the results of a mediastinitis. He referred to a recent report by Kuckein of two cases of carcinoma of the esophagus in which practically all the most important signs of aortic aneurism were present, while typical signs of carcinoma of the esophagus were absent. In both cases there was even an enlarged shadow in the region of the aorta, and this was seen to have an expansile pulsation. This sign, however, proved to be due to the fact that the aorta had been thrown out of its course by the mass and lay in direct contact with the tumor at the external surface. The shadow, then, was made by the aorta and the tumor together, while the expansile pulsation was given by the dislocated normal aorta; but the conditions were indistinguishable from those found in aneurism. It would seem entirely possible for a similar condition to be present in a case like that shown. Mediastinitis could readily cause displacement of the aorta, and a consequent appearance like that in the skiagraph. This seems somewhat more probable in this case, as there was apparently a slight Broadbent's sign, and as Dr. Le Boutillier stated that the cardiac dulness is not movable when the child shifts her position from side to side. Besides, the child has a history of rheumatism. Aortic aneurism could certainly give rise to the condition present more readily than could any other disorder; but, since a number of the most important signs of aneurism are absent, it seems worth while to think seriously of the possibility of some other condition as the cause of these physical signs. The entire absence of severe and more or less constant thoracic or referred pain, of changes in the pupils or in the voice, of any notable difference between the pulses, and of a strong tracheal tug, makes a diagnosis of aneurism somewhat doubtful. Skiagraphy, while undoubtedly extremely important as a means of diagnosis, cannot be considered to furnish absolutely final evidence.

Dr. D. J. Milton Miller asked whether there is an expansile pulsation present upon bimanual palpation of the chest. He had attempted to elicit this sign, but had been unable to discover it. There is also an absence of accentuation of the second aortic sound. He thought that in an aneurism as large as the superficial dulness in this case seems to indicate, it would be most unusual to have an absence of diastolic shock, and especially an absence of an accentuated second aortic sound. The two signs mentioned are extremely important signs of aortic aneurism; and Dr. Miller believes that accentuation of the second aortic sound, in particular, is a very reliable and constant sign of aneurism. While the conditions present in the case exhibited strongly indicate an aortic aneurism, the absence of the two signs mentioned by Dr. Miller makes him somewhat doubtful as to the diagnosis.

Dr. Le Boutillier, in reply to Dr. Griffith's question as to the age, said that there are on record several cases of internal aneurism in infants, but that none of these are cases of aneurism of the aortic arch.

In answer to Dr. Edsall, Dr. Le Boutillier said that he believes that competent skiagraphers generally consider that the presence of a growth can usually be differentiated from aneurism by the difference in the shading of the skiagraph. As to the absence of many of the symptoms of aortic aneurism, this is a point of interest in such cases in children, as contrasted with aneurisms in adults. The absence of many symptoms is an extremely common thing in the reports of these cases in children. Of the cases that Dr. Le Boutillier has found in the literature, many show almost no history of pain; tracheal tug is not mentioned in any instance; there is no unilateral flushing or sweating recorded; and in a large proportion of the cases definite signs of aortic aneurism were not present.

In reply to Dr. Miller, Dr. Le Boutillier said that an expansile pulsation has at times been present, and that the aortic second sound has often been found to be markedly accentuated.

The President then delivered the Annual Address, and the Society afterwards went into a general business session.

EDITORIAL

ANTISTREPTOCOCCUS SERUM IN SCARLET FEVER

The etiological rôle of the streptococcus in scarlet fever is still much in dispute, but it is noteworthy that many of the most eminent pediatrists of this country and of Europe are becoming more positive in their belief that the streptococcus is *the* important agent.

No more decided note could have been struck than the recent reassertion of A. BAGINSKY (*Berliner klinische Wochenschrift,* December 1, 1902), who cites a total of 701 cases in which streptococci were sought for, with positive results in 696 cases.

He bring out, however, that among these 696 positive findings there were no constant cultural characters in the streptococci found.

From the standpoint of the statistical argument, Baginsky recognizes that the value of any new therapeutic procedure must not rest on a year's figures alone. For scarlet fever it is widely recognized that the mortality varies from year to year in the institutions in which the hygienic conditions and medical treatment are practically constant. In his own hospital experience, in a series extending over 10 years, the mortality varied from 12 per cent. to 34 per cent.

In a group of 62 cases treated with injections of Aronson's antistreptococcus serum the mortality was 11.3 per cent. Baginsky compares these results with those obtained in 63 cases which rereceived no serum; in this group the mortality was 14.3 per cent. The difference is not such as to prove the value of the serum. A closer study of the clinical course of the cases which received serum treatment does not reveal any striking results which might be attributed to the antistreptococcic serum. In four cases the symptoms following the injection were distinctly aggravated, and on this account Baginsky thought it wise to abandon the treatment altogether for a time, but resumed his experiments later under the greatest possible precautions. With the serum recently produced by Aronson, the results have been, if not strikingly good, at least encouraging. Aronson's serum differs from the Vienna serum of Moser in the method of its preparation. Aronson first passes his streptococcus cultures, obtained from scarlatina cases, through a series of animals in order to increase their virulence; the virulent cultures resulting from this process are then used to inoculate the horses from which antistreptococcus serum is obtained. Moser, however, practices direct inoculation of horses with streptococci obtained from human beings.

This as the last pronouncement of the subject from a European authority, while not encouraging, bears with it a certain amount of assurance that the goal is in sight at least, and that the concerted efforts of bacteriologists will soon give us a specific serum.

SUBSTITUTION

An editorial under the title "Is This Wolf! Wolf!" in the *Medical News* of January 24, 1903, states this subject so aptly we are tempted to quote it in full for the benefit of our readers.

"For years the medical journals have been trying to convince the practitioner of the widespread evil of substitution and adulteration in drugs. But the profession has turned a half credulous, half indifferent ear, as if bored at the familiar sound of 'Beware of Substitution,' and 'None genuine without this mark.' They have in some instances hinted that it was necessary for the journals to support their advertisers: and have firmly believed that the adulterations were confined to proprietary medicines put up in labeled bottles and taken at the public's risk.

"How many physicians make a practice of going behind the scenes and watching the preparation of a prescription, and how many if they did so would be able to tell by the form in which the crude drugs were handled whether they came originally from reputable sources, or whether they were bought by the honest but misled druggist, from middlemen who successfully adulterated their wares?

"From the laboratories where the exact potency of an absolutely pure drug is determined for endorsement in the U. S. Pharmacopœia, to the druggist's counter where supposably the same potency is being handed out on a physician's carefully written prescription there is often so wide a variation that one wonders whether it would not be safer for us to go back to the days of herbs and simples, and to cull and brew our own remedies.

"At last the Health Department of New York has brought to the attention of the medical profession through the daily press, a forcible reminder of the widespread practice of substitution and of the adulteration of drugs. The medical profession has for years been thwarted in the greatest emergencies by the false values of the remedies furnished to their patients in their prescriptions. But the public has treated them with that tolerant, easy-going air of good-natured understanding, as though one should say, 'It *is* hard to see another man getting one's profits,' and has given the warning no more thought than would be bestowed upon a patent medicine vender's earnest plea to 'Take no other,' and 'Beware of substitutions.'

"Commissioner Lederle has set in operation a wholesale examination of the stuff that is commonly sold as phenacetin. His physicians and staff have purchased phenacetin powders from 373 drug stores, in Manhattan and Brooklyn. The official report gives the names of all, and includes many well known drug stores and department stores. *Among these samples, only 58 were found to be pure phenacetin, while the greater number, 315, were adulterated.* The chief adulterant was found to be acetanilid, selected undoubtedly because of its cheapness, and its similar effects, in part, to phenacetin.

"In the sale of an ordinary ten-grain pure phenacetin powder, the druggist makes a little over 200 per cent. He buys the phenacetin at $1.00 per oz. and retails it in small quantities at $3.20 per oz. If his adulterant be acetanilid it is bought at the rate of 2½ cents an ounce, leaving him his sales almost clear. This mean and petty money traffic need not, however, be laid at the door of the retail druggist alone. It is important to lay the blame, however, where is it due, for the question is one with a double moral issue. The physician does not trouble himself about the druggist's profit or his sense of honor in dollars and cents; but he has his patient's health in his hands, and when he finds, if ever he does learn, that a cheap heart depressant such as acetanilid is given in his prescription instead of the drug on whose certain action he is depending, he is justified in his honest indignation.

"This is by no means a single instance. Nearly every drug in the Pharmacopœia is adulterated, and as such fails to give the desired action. So great has this evil become that we often confess to one another that we prescribe less and less, and confine ourselves to a few fundamental drugs, remedies which we think we obtain from reliable sources and give in cases of necessity, leaving our patients to take their favorite compounds of tonics and appetizers on their own responsibility.

"If drugs could be treated sacredly, exactly, and conscientiously by the druggists, and by the public, as they are in hospitals, in experimental laboratories, and as physicians themselves treat them, the practice of medicine would be a much more satisfactory profession than it is at present.

"We trust that in this particular case the New York Board of Health, which does nothing by halves, will trace this scandal to its source, and further, we hope that physicians and druggists will prove as energetic as are the manufacturers of cereals and baking powders in establishing pure food laws, and will bring the enactment about pure drug laws, that will at least serve as a warning to offenders, and a caution and protection to the trusting prescribers and buyers of drugs."

Certainly in the therapeutics of children's diseases it is imperative to have pure drugs as the balance between life and death is often a close one and such practices as here outlined deserve unmeasured condemnation.

ABSTRACTS

The Passage of Albumin through the Placenta.—A. Ascoli (*Zeitschr. f. Physiol. Chem.*, Oct. 31, 1902) says the discovery of the oxyhemoglobin spectrum in the venous blood of the umbilical vein by Zweifel was the first demonstration of the passage of a normal constituent of the blood through the placenta, and the old controversy over the theory of Mayon that the placenta is the respiratory organ of the uterus, was finally settled. Harvey promulgated the view that the placenta, like a digestive organ, elaborates the nutriment of the fetus, and Claude Bernard attributed to the placenta a glycogenic function. Of the normal blood constituents finely emulsified fat penetrates through the placenta with as much difficulty as white blood cells; on the other hand, water, sodium chloride and sugar can pass through the placenta into the fetal blood. Whether albumin can pass through unchanged or in the form of peptone, or whether it is formed synthetically in the fetal organism, has not been proved. The author set out to investigate this problem, availing himself of the recently discovered biological reaction for albumin, *i.e.*, the production of specific precipitating bodies in the blood by the injection into the latter of solutions of various forms of albumins. He arrived at the following results. If large quantities of heterogeneous albumins be injected into the subcutaneous cellular tissues of pregnant animals, the former will be detected in the maternal and often at the same time in the fetal blood. If the reaction in the maternal blood is moderate or slight, as is the case when small quantities are injected or when large quantities are administered per os, the reaction in the fetal serum will be usually negative. In all cases there is a decided difference in the strength of the reaction between the maternal and the fetal sera; in the former it is always stronger than in the latter. After the administration of large quantities of egg-albumen per os, the presence of this substance can be demonstrated in the blood of pregnant and parturient animals, but not in that of the fetus. This is not a manifestation of any inhibitory action of the fetal serum; it is rather to be considered as a particular function of the placenta, probably of the nature of a digestive act.

The Necessity for the Interruption of Pregnancy in Phthisical Workingwomen.—C. Hamburger (*Berl. klin. Woch.*, Nov. 24, 1902.) Eighteenth century writers regarded pregnancy as an advantage to phthisical women; it was supposed that if two women were suffering from pulmonary tuberculosis, the one of them who became pregnant was likely to live longest. Modern writers have wholly abandoned this view and the author declares that it is now universally conceded that pregnancy and labor influence unfavorably the course of phthisis, because of their excessive demands upon the vitality of the woman, in virtue of which her susceptibility to tuberculosis is increased. The logical inference is plain: tuberculous women must not have children; if pregnancy occur, it must be interrupted in the interest of the woman. This inference, says Hamburger, is not frankly made as often as it should be. Only recently Kossmann has declared that "pregnancy is only to be interrupted when failure to interfere would inevitably result in the death of the mother during gestation and so cause the death of the fetus as well." Hamburger remarks that the problem must be approached according to the social class of the individual, because the demands during pregnancy upon the strength and vitality of women belonging to the working class are far greater than upon those of the more fortunate classes. The mortality from tuberculosis increases as the family income decreases. Hamburger therefore undertakes to support his position by giving a series of pictures of the actual life of pregnant workingwomen, showing how many children they have, what their incomes are, how many persons live in one room, or sleep in one bed, and hence what the probable outcome of tuberculosis in such circumstances is likely to be. Von Leyden and others emphasize the especial danger of repeated pregnancies occurring at brief intervals in phthisical subjects, and it is precisely among women of the working classes that rapidly repeated pregnancies occur. The treatment of tuberculosis in poor women is at best a difficult task. Its difficulties become overwhelming when pregnancy occurs. Good nourishment is indispensable; but during pregnancy there occur vomiting and stubborn anorexia. Workingwomen are denied good air, bodily rest, concentrated foods, careful nursing in confinement, rest after confinement. Hamburger considers the dangers of abortion, but does not regard them as serious in comparison with the greater risk of prolongation of pregnancy. It is argued that the probability of renewed conception and the necessity for renewed interference make any interference inadvisable. He replies that it is the duty of the physician to instruct phthisical patients as to the dangers of renewed conception. To those who hesitate to destroy the fetus because of the possibility of its developing into a healthy human being the writer points out that so far as the children of the poor are concerned such hopes are almost idle, because in this class of society, isolation from the mother is an impossibility, and hygienic surroundings cannot be provided. For all these reasons he believes that pregnancy occurring in phthisical workingwomen should be interrupted; its interruption is demanded in the interest of the mother, of the family, of the community.

The Histology of the Smallpox Lesion.—Roger G. Perkins, M.D., says that in view of the prevalence of smallpox in the United States during the past few years there are no details of the disease which are without interest to the profession at large. The busy practitioner has no time to go beyond the clinical features, but it is through the laboratory examination of the finer details that the essential cause and the influences that bear upon it will be given to the world.

The study of the histology and etiology of variola has received widespread attention, and the results so far obtained may be brought into a comparatively brief compass. Early investigators regarded the process as infectious, starting from multiple points in the skin and progressing to a definite acme. At this point the process became reparative in character, until healing was complete. Later observers, among the most prominent of whom was Weigert, considered the starting-point to be the simultaneous necrosis of a number of cells, due to the presence of a toxin, and that the subsequent changes were more or less secondary to this necrosis. The present view is rather in favor of the first suggestion, that the process is infectious rather than toxic.

The majority of the changes occur, in the *stratum mucosum,* just underneath the horny layer, except in those parts of the body in which this last layer is of unusual thickness, as on the palms and soles. In these areas the lesion is almost entirely in this layer.

Among the first changes is a sharply-localized edema, which causes the well-known shot-like hardness of the papules in variola as distinguished from other similar diseases, especially varicella. The cells just underneath the horny layer swell, lose their prickles, and their protoplasm becomes fluid. The nuclei at first show no particular changes, but when the pressure in the cells becomes excessive the walls rupture, the nuclei are extruded and fragment, and the cell-membranes shrink together. The cells in this neighborhood are denser than those lying deeper, as they are undergoing preparation for the horny layer, and the shrunken walls persist, forming septa, lying for the most part perpendicular to the surface of the skin. These septa divide the lesion into a number of pockets, giving rise to the well-known fact that it is very difficult to evacuate the pock in variola, because a puncture opens only one or two of these small areas.

At this stage the exudate is composed of serum and a large number of plasma-cells. The presence of these last in quantities at so early a stage is supposed to indicate that the infection is a severe one. There are very few pus cells, and no bacteria.

The cells of the deeper layers do not liquefy, but undergo a peculiar form of degeneration. The cell-body swells and the nuclei divide extensively within it, so that the cells look like small balloons filled with balls, for which reason Unna has given the name of "ballooning degeneration."

It is at this stage that the umbilication so characteristic of variola occurs. The cause has been much in dispute, and there is as yet no absolute agreement on the subject. It is obvious that when there is a hair in the center of the pock the swelling may be restrained in the neighborhood of the hair by direct adhesions, but since it is also true that there may be umbilication without any central hair, and that there may be none even when there is a central hair, this cannot be set down as the essential cause. The presence of the septa above mentioned is probably of no moment as they are so easily destroyed in the subsequent stages. The occurrence of the phenomenon seems rather to be due to the more active swelling of the cells at the periphery of the lesion, where the process may be supposed to be more acute, and to the greater liquefaction at the center, tending to a depression.

This stage reaches its full development at about the sixth or seventh day, and from this point the appearance is markedly different. There is a marked dilatation of the blood-vessels, which have hitherto shown no special changes, and the plasma cells are replaced by the ordinary polymorphonuclear leukocyte or pus-cell. The septa are absorbed and broken down, the umbilication disappears, and a simple pustule is left. From this point the regenerative changes begin. The pustule absorbs and breaks down the overlying horny layer, which has resisted the previous stages, and dries up, forming a scab over the surface. After the formation of the scab the intact epithelium on all sides begins to grow in beneath, in the manner of the closing of an iris diaphragm, finally pushing off the scab and leaving a surface completely covered by epithelium.

In the confluent variety the only essential difference histologically is that pocks are so close together that the septa between them become broken down, forming wider areas of the same type. When the attack is a mild one the papillæ are not involved, at least to the extent of necrosis, and the epithelium of the *stratum mucosum* is able to fill all defects. But when the infection is more severe, or when the formation of pus has been stimulated by scratching, there is more or less widespread destruction of these papillæ, and while the epithelium can *cover* the defect, the papillæ are not regenerated and a depressed scar is left.

Though it is practically certain that smallpox is an infectious disease there is as yet no organism which is acknowledged as the cause. There is little doubt that all bacteria which have been described as the cause have been secondary infections, or introduced by errors in technic, and apparently successful inoculations with them have been due to the carrying over of some of the original lymph into the animal under experimentation.

Failure of proof of bacterial origin led to search for some other organism, and observers in England, Germany and Italy described organisms of the group of protozoa. These were not cultivated, and much stress was laid on the appearances in stained sections, the so-called "cell-inclusions." These are very similar in type to the appearances of the same type in malignant tumors which have been fairly conclusively shown to have nothing to do with any parasites. The uniform failure to cultivate the organisms described, and the consequent inability to reproduce the disease with pure cultures, the only proof which can be accepted as final, have prevented the scientific world from receiving these results, but recent literature contains some articles of great interest in this connection.

Funck in Germany, and Ishigami in Japan, claim to have discovered a protozoan in the vesicles of variola and vaccinia, which has a definite life cycle and which can be cultivated. Claim is also made that the cultures of the organism on the special media used are virulent up to the third generation, and the results are almost uniformly successful. If these results are substantiated, they are of immense value, but the failure of confirmation of so many similar claims in other diseases, and especially in malignant diseases, makes us skeptical, until additional work, by unprejudiced observers working with the same methods reaches the same results. Until then the verdict must be the same as in the case of malignant diseases—not proven.—*Cleveland Medical Journal.*

Epidemic Edema in Infants.—At the Lying-in Hospital, Providence, during an epidemic of gastro-enteritis among the babies, thirteen cases of edema made their appearance in eleven days. The patients all had gastro-enteric trouble either immediately preceding or at the onset of the edema. Their ages varied from six days to two years. Four of the cases left against advice, and the remaining nine all died after being several hours in collapse. There were no convulsions or coema. There were six post-mortems, three of which showed broncho-pneumonia, one day, one month and two months respectively after the edema had disappeared. The cause of death in the others was not clear. The symptoms were as follows: Face pale, pasty-looking, apathetic, depressed, temperature subnormal, skin dry, soft, deeply pitting on pressure. In a number of the cases the edema was intense, and would rapidly change from the face to the legs or other parts of the body and *vice versa.* The weight increased before or with the appearance of the edema and decreased when the edema subsided. The urine in nine cases contained albumin, but the casts were very few or none. One case which died while the edema was present showed normal kidneys at autopsy, so the kidney trouble was evidently not primary. The children were in three different wards on different floors, attended by different nurses, yet the trouble broke out simultaneously. All the patients were artificially fed, and this suggests that the milk may have caused the gastro-enteric trouble, and that some toxic products from this may have caused the edema. In discussing the causes of edema in infants, the author considers this epidemic to be most closely allied with the edemas occurring in depleted and anemic infants. The *Bacillus aerogenes capsulatus* is of interest in this connection.

Saline Diuretics.—A. R. Cushney (*Journal of Physiology,* Dec. 15, 1902.) This author maintains that the absorption from the renal tubules in the rabbit when the outflow through the ureters is obstructed, is differential, the water and chlorides returning to the blood much more rapidly than the sulphates, phosphates and pigment. The presence of these last in the glomerular secretion must therefore tend to retard the absorption of water by opposing osmotic resistance to the absorbing force; when as after their intravenous injection, they are present in large amounts, the urine is increased more than when such permeating bodies as the chlorides are in excess. If the absorption in the tubules under normal circumstances is similarly differential, as appears probable, this is sufficient explanation of the variation in the diuretic action of different salts. The saline diuresis seems to be due not to stimulation of the excretory cells of the kidney primarily, but to the changes in the circulation of the kidney; for when these are excluded, the ingestion of salt solution causes little or no change in the urine, and on the other hand, an increase in the volume of blood, without change in its constituents, appears sufficient to induce diuresis.

Preliminary Note Upon Employment of an Anti-Streptococcus Serum in Severe Cases of Scarlet Fever.—Geo. A. Charlton, M.D. (*Montreal Medical Journal*). The author for now close upon two years, has been engaged upon a series of studies upon the cases of scarlet fever admitted to the Montreal Hospital for infection diseases, and upon the treatment of the same. The results obtained seem remarkable. So striking have they been, that he felt that he dare not publish on the subject until he had accumulated a larger number of cases and could place himself in a position beyond any reasonable doubt. His intention had been to wait until he could report upon at least thirty, preferably fifty, cases that had undergone the particular treatment, the number depending upon whether the epidemic of last year continued through to this autumn and winter. The singular harmony between the results in Montreal and those recorded from Vienna, absolved him, he thought, from the necessity of waiting any longer.

The administration of anti-streptococcus serum seemed to be indicated, to counteract the effects of the toxins of the streptococcus and to bring about the destruction of that organism. For it appeared that if this could be accomplished, the cases would resolve into a less severe type and the prognosis would become more favorable.

The various anti-streptococcic sera have, from time to time, been tried in these cases by Baginsky and others, including the author, but with little or no result. Within the last few months, however, he has had submitted to him, and has been given the opportunity to test, an anti-streptococcic serum, produced in the biologic department of the firm of F. Stearns & Co., of Detroit and Windsor, under the direction of Dr. Hubbard, head of that department. Full information has been given to him regarding the mode of production of that serum, and he has himself tested and tried the streptococcus employed in the process of production. It is but fitting that Dr. Hubbard should himself announce the methods by which he has obtained this serum. All that is necessary for him to state is that it is produced along the lines of other sera, a special process being employed, and that in his hands it has proved itself remarkably effective. Nor does he pretend to explain why the anti-streptococcic serum is more active than any other in this particular class of streptococcus infections, nor discuss whether we here have to deal with a distinct species of streptococcus, or with a strain modified by growth in association with the causative agent of this peculiar disease.

So far, since the 24th of June last, he has employed it in the treatment of 15 cases. These cases were all severe, and the majority of them, he has no hesitation in saying, under ordinary treatment, would, if they had not terminated fatally, at least have suffered from lingering and troublesome complications. As it was, there were 13 prompt recoveries, almost free from complication. Not one of the 13 has suffered from albuminuria nor from suppurative otitis media. In all, upon admission to the hospital, there was involvement of the cervical glands, but in only two instances did this go on to suppuration; the usual termination was by resolution within 48 hours after the injection of the serum. Another interesting feature of these cases was the rapidity with which desquamation proceeded. It was usually completed by the thirty-second day of the disease, and thus it frequently happened that a severe case was discharged before a milder one which had been admitted at the same time, but had not been treated by the serum.

Two deaths have occurred in this group of fifteen cases. One of these patients was in a dying condition when admitted to the hospital, and lived only four hours. The other, upon admission, was suffering from a severe pneumonia, and though improving somewhat, succumbed five days later to an attack of laryngeal diphtheria.

The quantity of serum injected has been moderate. His usual dose has been 20 c.cm., but in those cases which from the severity of the attack seemed to require a larger quantity, this dose has been repeated. In this respect the serum appears to be more active than that employed by Professor Moser. The effect was usually prompt: the temperature began to fall within two hours after giving the injection, and became normal in from two to four days. There has been no other treatment in these cases except stimulation during the first three or four days, with the usual precautions as to laxatives, diet and rest. And lastly, no adverse symptoms, either local or general, have so far arisen from the use of this antistreptococcic serum.

It does not, he holds, cure scarlet fever, but its timely administration in the severe cases tends to allay unfavorable symptoms, overcomes complications and, given at an early stage of the disease, it prevents a fatal termination.

Sublamin in Hand Disinfection.—D. Engels (*Arch. f. Hygiene,* Vol. 45, No. 4). Extensive bacteriological tests with sublamin, a combination of mercuric sulphate with ethylenediamine, shows that the drug is an excellent disinfectant for the hands. In two to three per cent. aqueous solution it does not irritate the hands, and it can penetrate into the depths of the skin and there kill all germs, and all pyogenic germs readily succumb to its influence. It is very readily soluble in water and nickel-plated instruments are not attacked by it. It is more difficult to obtain a strong alcoholic solution, but this is even more efficacious than the aqueous; a two pro mill. solution seems to act better than a stronger one. The greater penetrating powers of sublamin as compared with sublimate probably depends upon the organic radical, for ethylenediamine resembles ammonia in its softening and dissolving properties without being irritating. In strength one part of sublimate corresponds to 1.7 of sublamin, yet the latter is only one-tenth as poisonous. There is no reason why it should not entirely replace sublimate in hand disinfection.

Chronic Joint Disease in Children.—Henry Ling Taylor (*Med. News,* August 16, 1902). Chronic joint disease in children in nine cases out of ten, probably oftener, means tuberculosis, says this author. Statistics of over 13,000 cases show, as to the distribution of the disease, that rather more than two-fifths are vertebral, somewhat less than two-fifths are situated in the hip, and about one-fifth in all the other joints; of this remaining fifth the knee claims more than half. One of the most marked characteristics of tuberculous joint disease is its insidiousness. The symptoms vary, but the most characteristic one is stiffness or limitation of motion due to peculiar spasmodic contraction of the muscles. In vertebral disease the location of the pain varies; it is found in the neck, shoulders and back of the head in cervical disease; at the sides or front of the chest and in the abdomen in dorsal disease; in the loins, lower back, lower abdomen, through the hips or down the thighs, or even in knee, leg, ankle, or foot, in lumbar disease. The medical student clings with as desperate tenacity to the knee pain of hip disease as a pathognomonic symptom as does the school-boy to the date of the discovery of America as the key to all history. It is well to know that disease of the lumbar spine, knee disease, and other affections may cause pain in the knee, and that it is frequently absent in hip disease. The endeavor to elicit pain in the suspected hip by forced movements, pounding on the heel, or otherwise, is perfectly useless and may prove injurious. One should, on the contrary, seek to demonstrate and define the limitation of motion and the involuntary, spasmodic muscular contractions without pain to the patient. The limitation of hyperextension at the hip is the earliest and most delicate test. In knee disease the joint very rarely becomes flexed and causes limping, which may be intermittent. There seems to be an antagonism between rheumatism and gout and tuberculous joint disease; also between rickets and joint tuberculosis. There are probably few chronic diseases in which correct early treatment is so beneficial, and in which the results of delay are so serious, as the chronic joint diseases of children.

Intravenous Administration of Anti-Diphtheritic Serum.—D. R. Cairns (*Lancet*, Dec. 20, 1902). The treatment of diphtheria by the injection of serum has passed its experimental stage. The method has usually been a subcutaneous injection. Intravenous injection of the serum is comparatively new and the points in its favor are argued in the following terms by the author. The marked reduction in the case mortality in diphtheria effected by the introduction of the diphtheritic antitoxin is admitted by everyone, but, great as this reduction has been, the experience gained in the treatment of this disease in the city of Glasgow Fever Hospital, Belvidere, suggests that even a further fall in the case mortality may be hoped for. The lines along which this improvement may be effected are twofold, (1) by the exhibition of larger doses than those commonly recommended and (2) in certain cases by the intravenous use of the remedy. The employment of larger doses of serum has been already advocated by several observers, but, so far as the author is aware, no one has recommended the intravenous use of the remedy. In a paper dealing with the serum-treatment of bubonic plague he has advocated the intravenous use of Yersin's serum as a most useful adjunct to the subcutaneous injection of the remedy, and the encouraging results obtained in apparently hopeless cases of this disease suggested the employment of the same method of administration in the treatment of severe cases of diphtheria. Both diseases are due to the reception at a particular part of the body of a specific microorganism which must be considered as the essential cause of the lesion, while the general symptoms of the disease are brought about by the absorption into the system of a definite chemical poison which is formed by the life-processes of the organism at the seat of inoculation. In plague the subcutaneous injection of Yersin's serum is followed not only by a marked antitoxic effect, as evidenced by improvement in symptoms, but when introduced into the lymphatic drain toward the bubo a directly bactericidal effect can be demonstrated, the organisms contained in the bubo showing evidences of degeneration very soon after the administration of the serum. When given subcutaneously, however, even in large doses, the effect of the serum appears to be chiefly a local one, degeneration appearing only in those organisms which lie within the area of injection. By the intravenous method, the maximum influence of the serum on the tissues and also on the organisms is obtained with greater rapidity than when the serum is used subcutaneously, and those bacilli which have overflowed from the primary focus of infection into the circulation can be reached directly, and similar degenerative changes be produced, while at the same time the circulating toxin is most effectively dealt with. The fact that the administration of even large doses of serum subcutaneously is not followed by a commensurate improvement suggests that the serum in its passage through the lymphatic vessels and glands undergoes a qualitative change whereby its power of neutralizing toxin is considerably diminished. This may be due to (1) a selective action exercised by the lymphatic glands in filtering out the active constituent of the serum, or (2) to the fact that, as Ehrlich has shown, there are a definite chemical action and reaction between toxin and antitoxin, neutralization going on more quickly and more effectively in concentrated solutions than in diluted ones. In the case of plague the local action of the subcutaneous injection of serum is probably directed in the first place to the neutralization of the toxin locally present in the bubo and its vicinity and also to inducing bacillary degeneration in the comparatively large number of organisms present in the primary lesion. Any surplus of antitoxic bodies which reaches the general circulation after passing through the lymphatic channels will probably be present in the blood in such a state of dilution as to be comparatively ineffective, especially in septicemic cases of plague. By immediate introduction of the serum into the general circulation, however, those bacilli which have found their way to the deeper organs may be destroyed and the circulating toxin neutralized by the comparatively concentrated solution of antitoxin.—(*Medical News.*)

Summer Diarrhea of Infants.—W. Cecil Bosanquet (*Practitioner,* August, 1892). This author says that: (1) It is easier in this disease, as in others, to prevent infection than to cure the patient when it has occurred. (2) There is no "average baby," and no one method of treatment avails in all cases. The disease may vary in severity in different countries, so that methods of treatment found successful in England may be ineffectual in Australia or in the United States. (3) Whether the disease be due to an extrinsically formed poison which is taken into the alimentary canal or to toxins formed by bacteria within the body, it is equally evident that the first indication is to assist Nature in expelling the offending material. The diarrhea is, therefore, not in itself harmful or to be rashly interfered with by drugs. It has indeed been said that it would be no worse practice to seal up an abscess cavity and prevent the escape of the pus than to prevent the peristaltic action of the bowels in gastro-enteritis and thus aid the absorption of toxins from the intestine. (4) Since there is little doubt that the poison or infective organism is conveyed by means of milk, it seems advisable in all severe cases temporarily to suspend the use of this food. But as milk is the natural diet of infants—and it may be remembered that in adults suffering from diarrhea a milk diet is usually insisted upon—it is advisable to resume its administration as soon as possible, with due precautions against further infection. (5) After the offending materials have been expelled from the body, attention must be directed to maintaining the alimentary canal, as far as possible, in an aseptic condition, and soothing any remaining irritability of the mucous membrane. (6) The prominent clinical phenomena suggest the necessity of supplying, if possible, the fluid lost to the body; of reducing the temperature when it is excessive, and supplying heat when the extremities are cold and collapse imminent; and of aiding the failing heart by stimulants.

Peliosis Rheumatica in Children.—H. HEIMAN (*Archives of Pediatrics,* Dec., 1902). This disease is believed by Baginsky to be non-rheumatic. The author, however, finds clinical features which indicate a correlation with rheumatism. The onset of peliosis is usually with sore throat, mild febrile disturbance and pains in the joints. The joints of the upper limbs are more often involved in children than in adults. The joints are painful, tender, very little swollen and not reddened; the pain diminishes as the rash appears. Tender nodules sometimes occur beneath the skin. In children the constitutional symptoms are milder than in adults, the rash more extensive, more joints are involved, the duration is longer, recurrences are more common and tender subcutaneous nodes are more frequently seen. Unger says that in children there often occurs edema about the lumbar region of the spine. Fuchs holds that there is always desquamation after peliosis and not after purpura. Monti says that the disease never occurs in nursing babies. The author describes the case of a boy of eight years with purpuric spots in the mouth, marked tenderness of the abdomen, and the development of an apical systolic cardiac murmur not transmitted to the axilla. The murmur was not audible a week later, and the cure was complete three months after onset of the disease.

Alkaloids of Ipecac.—C. LEWIN (*Arch. Internat. de Pharmacodyn.*, Vol. XI, fasc. 1 and 2). This author reviews the published literature on ipecac and adds his own observations on the physiological action of the different alkaloids. The toxic symptoms caused by cephaline hardly differ in any respect from those of emetine. Both alkaloids irritate the mucous membranes, hence many who come into intimate contact with the drug suffer from conjunctivitis, coryza and cough. The subcutaneous connective tissue is not irritated, since in none of the animals did inflammation develop at the site of injection. This proves a specific irritating effect of the drug upon the mucous membranes. Both alkaloids are cardiac poisons. The injected animals die of cardiac paralysis. Emetine injures the heart in much smaller doses than cephaline and affects more the frequency of contraction, while the latter exercises its influence more upon the pressure. The characteristic intestinal symptoms are caused by both, but cephaline acts more upon the kidneys. Part of both alkaloids seems to be excreted through these organs. Poisoning with emetine leaves the lungs free of pathological changes; with cephaline there may be slight extravasations of blood. Vomiting may be induced by both, whether given by mouth or subcutaneously, but cephaline is undoubtedly superior in this respect, while emetine is the better expectorant. From the composition of the two varieties of the drug, it follows that Rio ipecac is to preferred as expectorant and Carthagena ipecac as emetic; where, however, the patients are only allowed to gargle, on account of weakened cardiac action, the latter is also better as expectorant.

Itrol and Cuprocitrol in Eye Lesions.—D. CERVICEK (*Militärarzt,* 1902, Nos. 19 and 20). Washing the eyes with a three per cent. solution of boric acid and then dusting itrol into the conjunctivæ, forms an excellent treatment for gonorrheal ophthalmia. After a few applications the author has seen the purulent secretion disappear in 65 per cent. of the cases, in the others from 6 to 20 applications were required to cure the disease. The reaction which follows varies considerably with the susceptibilities of the different patients and on the whole is somewhat more severe than with the usual silver nitrate solution; on the other hand, itrol is easier to apply and has a more prolonged action. After a while, a tolerance is established, and the patients no longer complain. The results were also gratifying in discharging trachoma. Great care must be exercised to protect the drug from light, as it readily decomposes. The treatment of trachoma by means of massage with a five per cent. ointment of cuprocitrol must be regarded as another advance in ophthalmology, for astonishing results were obtained with cases of as much as eight years' duration. The massage must be gentle but thorough; it is best conducted with a glass rod.

Creosotal in Croup.—L. Lasansky (*Deutsche medicinische Zeitschrift,* 1902, No. 91). The beneficial results obtained with creosotal in disease of the respiratory organs led the author to try this drug in croup, with pronounced success. In one case a complicating pneumonia was checked at its onset and a favorable change in the croup itself brought about over night. Two similar cases also improved rapidly, while some of those treated with serum died. The author now prescribes creosotal in pseudo-croup, measles and pertussis, and is well satisfied with the results. At first a dose sufficiently large to cause the characteristic odor about the breath and perspiration must be used; when the fever falls, smaller doses are employed for some time to prevent a recurrence. As vehicle, the old-fashioned infusion of ipecac with anisated ammonia is excellent.

Sudden Death in Children.—P. Krantwig (*Archiv. f. Kinderheilkunde,* Vol. 35, pts. 3 and 4). Sudden death in the case of a child said to have been perfectly healthy, is not always to be ascribed to the ignorance and negligence of the parent. This is shown by the fact that it sometimes occurs in the families of physicians. The author cites the case of Langerhans, whose twenty-two-months old child received an immunizing injection of diphtheria antitoxin and five minutes later displayed rapidly increasing agitation, had an attack of coughing, became pale and fell to the ground; it then had another coughing spell, became blue, the pupils dilated, the child swallowed several times, foamed at the mouth and then died. The father at first attributed the child's death to the antitoxin but later admitted that the status lymphaticus was the cause. The author believes, however, that the stupidity, indifference and superstition of parents are responsible for a great many cases of sudden death in children. A severe coryza in infants may be present for many days and pass unnoticed; likewise an extensive bronchitis may not be detected, the child having the strength neither to cough nor to cry. Intestinal disturbances and a slowly progressing cerebral disease are often disregarded. All causes of sudden death may be grouped under two general classes, syncope and asphyxia. Of the former there are numerous causes leading to cessation of the heart action: wasting of the heart muscle, fatty degeneration, wounds, anemia following occlusion of the coronary arteries; impediments to the heart's action by fluid in the pericardium or pleura, obstructions in the circulation, as in paralysis of the splanchnics and thrombosis of the portal vein. All these causes find few exceptions in children. Arteriosclerosis as a cause of sudden death is not seen in childhood. After the recovery from diphtheria, cases occur as the result of myocardial changes. Other causes are severe choleraic intestinal disturbances, producing anemia of the heart by paralysis of the splanchnics with consequent plethora of the abdominal organs, which together with ischemia may cause sudden death. Cases occur in rachitic children in whom the distended stomach and intestines may push up the diaphragm, and narrowing the chest cavity already compromised as the result of the rachitic process, may cause mechanical arrest of the heart. The toxins produced in intestinal disturbances, in infectious diseases, particularly diphtheria, and rachitis, may cause cardiac arrest by stimulation of the acceleration and inhibitory nerves of the heart, of the cardiac ganglia and the vasomotor and vasodilator nerves. Cases of sudden death during rapid healing of extensive eczemas in nurslings have been ascribed to some action on the innervation mechanism of the heart; acute nephritis has been found in such cases at autopsy. The other groups of causes leading to sudden death by asphyxia include the following: Direct restriction of the activity of the respiratory organs by pneumonia, bronchitis, atelectasis, etc.; occlusion of the rima glottidis by inflammation, edema, paralysis or spasm of the laryngeal muscles, compression by tumors, especially by an enlarged thymus gland; spasm of the diaphragm in tetanus and eclampsia; anemia of the medulla oblongata in heart-failure and hemorrhages; the inhalation of poisonous gases. Diffuse bronchitis and lobular pneumonia are sometimes not noticed by parents or nurses, and even physicians may be unaware of the gravity of a case. The author frequently experienced cases of children whom he left a short time before laughing and playing and who died suddenly with only a diffuse bronchitis discoverable at autopsy. He is of the conviction that many supposed cases of death from overlying (accidental suffocation of the infant by the mother during sleep) are really caused by an unobserved disease of the lungs. Tuberculous meningitis is frequently overlooked: the physician is first called when convulsions have set in and the disease is in full bloom. Asphyxia may result from the inhalation of foreign bodies, including flies and roundworms; the possibility of post-mortem migration of the latter is to be thought of. The aspiration of vomited material frequently occurs in childhood. Spasmus glottidis and compression by an enlarged thymus are the most frequent causes that operate through asphyxia. The author is of the opinion that laryngospasm is in most cases one of the manifestations of tetany. Both forms of nervous disturbance are rooted in the same soil as rickets. Spasm of the larynx is found most frequently in artificially fed infants of the poorer classes living in small damp rooms. The enlarged thymus is one of the manifestations of rachitis. Likewise the status lymphaticus of Paltauf and Exherich, although not directly specific of rickets, yet develops under the same conditions; the swelling of the lymphatic chain about the neck is analogous to that of the thymus gland. The author believes that most of the so-called cases of thymus-death are due to the effects of rickets; the metabolic products of the latter act upon the cardiac nerves and ganglia. The reason assigned for this opinion is the fact that frequently these cases appear suddenly without antecedent dyspnea, without the crowing or whistling sound, and without accompanying convulsions. The cases ascribed by Henoch to swallowing of the tip of the tongue are not now considered to be as frequent as formerly.

A Case of Liver Abscess in a Child Aged Two and a Half Years.—W. J. J. Arnott (*British Medical Journal,* Jan. 24, 1903). Abscess of the liver in childhood is almost unknown—it is said by Manson in his *Tropical Diseases* not to occur. Given, however, a predisposing condition, debility, and the same exciting cause as in adult life—namely, dysentery and its associated organism—there is no obvious reason why the disease should not occur, even if only rarely, in a child. It was this view of the matter which led the author to diagnose an abscess. The child was admitted to the Civil Hospital on April 16th, 1902, with a history of a neglected attack of dysentery. The stools were typically dysenteric in character. In addition to dysentery the signs of commencing tubercle in the lung were present. The general aspect was tuberculous, complexion very pale, and somewhat waxy in hue, and the mucous membranes extremely anemic. There was at no time any appearance of jaundice. Treatment was carried out in the open air, and both the bowel lesion and lung affection rapidly improved, all dysenteric symptoms disappearing in little over a week. The temperature in the evening had ranged to about 100 degrees F. for the first ten days after admission; it then remained about normal for the next nine days. At the end of that time it rose to 100 degrees F., two days later to 102 degrees F., and for the ensuing fortnight the morning and evening temperature ranged irregularly between 101 and 104 degrees F. There was nothing in the chest to account for this rise of temperature, as now, three weeks after admission, all signs of pulmonary disease had disappeared. The abdomen was distended, and with a little pressure to displace the bowel the liver could be felt to be enlarged about two fingerbreadths below the ribs, and to about the same extent in an upward direction. On inspection there was a slight fulness in the contour on the right side in the hepatic region, which was absent on the left side. The respiration was almost altogether of the thoracic type, and there was a certain amount of "catch" in, and acceleration of, the breathing, with nothing in the lung to account for it. Beyond this slight respiratory embarrassment the child did not appear to suffer pain. The pulse was weak and rapid, ranging generally between 120 and 130. Vomiting now became a very troublesome symptom, the child being only able to retain very small quantities of nourishment, and exhaustion was clearly threatened. The pressure of an enlarged liver was regarded as the cause of this vomiting, and on May 17th an exploring trocar and cannula were inserted in the tenth interspace in the anterior axillary line. Pus escaped through the cannula at the first puncture. The skin was frozen with ether, and an incision was immediately made over the spot in the intercostal space; a drainage tube was inserted, about 12 oz. of pus being discharged through the tube. Next day the temperature had dropped from 103 degrees to 99 degrees F., the vomiting had ceased, child was much relieved and slept well. During the next four days the evening temperature was below 100 degrees F., the pulse was quiet, the abdominal distension had disappeared, and the liver could not be felt below the ribs. At this stage a slight convergent strabismus was noticed for two days. Its ominous significance was not at once apparent; a day later, however, a hydrocephalic cry announced the presence of tuberculous meningitis. This was followed by convulsions, which lasted with intermissions till death took place thirty hours later, and six days after the abscess had been opened. Though the ending of this case was disappointing, seeing that incising the abscess had afforded such marked relief, nevertheless, on account of the early age of the patient, the author thought it worth recording.

Crede's Prophylactic Treatment of Ophthalmia Neonatorum.—E. Runge (*Berliner klin. Wochenschrift,* May 19, 1902) reports on the results of instilling a two per cent. solution of argentic nitrate in the eyes of the new-born, as a prophylaxis against ophthalmia neonatorum. The use of the procedure has recently been questioned by Hirsch, who, in dealing with the production and prevention of blindness, finds that, in his München experience, 1.5 per cent. of infants treated with argentic nitrate suffered from blennorrhea. In a series of 1,917 cases, not a single case of early infection was observed, and only three babies developed a late infection near the end of the second week. About twenty per cent. of the mothers were affected with gonorrhea at the time of delivery. The essential factor in the treatment consists of instilling the solution as soon as possible after the birth of the child. In these cases the two per cent. solution never caused any marked irritation of the eyes, but such appearances have been described by other writers, who now employ a weaker solution and obtain equally satisfactory results. In a series of 600 cases treated with a one per cent. solution, there was not a single early infection, and only one case of late infection.

Congenital Tuberculosis.—D. H. Andrews (*The Hospital*, Jan. 24, 1903) exhibited at a recent meeting of the Pathological Society, London, the lungs of an infant affected with congenital tuberculosis, a condition which, although very rare in the human subject, is well known to occur in certain of the lower animals. The infant from whom the specimen had been taken was stated to have died shortly after birth, and this was confirmed by the small size of the organs and by the fact that the ductus arteriosus was still pervious. The tracheal and bronchial glands were enlarged and caseous, a condition of affairs which must evidently have arisen long before birth, while the lungs contained numerous miliary tubercles. The histological appearances were quite characteristic of tubercle. As to the question how the infection had arisen, it was suggested that it had been caused by the fetus swallowing liquor amnii containing tubercle bacilli. These, it was said, might have been derived from a disintegrating lesion of the placenta, for it is known that the entrance of amniotic fluid into the mouth may take place during fetal life.

Résumé of the More Recent Advances in the Artificial Feeding of Infants.—Blackader (*Montreal Medical Journal*) emphasizes that it is extremely important that the milk used in infant feeding be obtained with such precautions as to render it free from bacteria. It is not always possible, however, to be able to obtain such with a regularity necessary for the daily preparation of an infant's food, and when the supply cannot be depended upon it appears the lesser of two evils to have the milk Pasteurized at the lowest efficient temperature, viz., from 150 degrees to 157 degrees F. Milk sterilized over 160 degrees F. is altered to an extent varying according to the elevation of the temperature employed and the duration of the exposure, in the following respects: The proteids are modified and rendered less digestible; the combination of the saline ingredients with the proteids appears to some extent to be broken up, and the salts assume a condition in which they are less readily absorbed; the natural ferments whose presence in milk may with much probability be inferred, and which may materially assist its digestion in the infant's stomach, are destroyed; and an alteration takes place in the emulsion normal to milk which may also have a distinct effect in lessening its digestibility by the infant. Milk obtained in the country from healthy pasture-fed cows, milked in the open fields, certainly is better not sterilized, but milk obtained in the city from more or less unknown sources, and under unknown conditions, should be Pasteurized, especially in summer weather. The following practical points may be emphasized: An infant fed at the breast, who suffers persistent indigestion and at the same time fails to gain in weight, should be taken from that breast. If, however, the infant gains in weight it is better to try and correct the indigestion by treatment directed both to the mother and child. To attempt artificial feeding in such a case often only adds trouble. In commencing artificial feeding begin with a weak mixture, and work up by frequent but slight changes to a point of tolerance. By still continuing a gradual but steady increase, never beyond the point of easy digestibility, we can in a few weeks attain to a food sufficiently nutritious in all its ingredients and yet fully digestible and assimilable. It is a serious mistake to begin on a mixture too strong, and work down after weeks of indigestion to the point of tolerance. The question how long an infant should be kept on a modified milk diet is an important one. It is generally conceded that by the tenth or twelfth month a child should be able to digest almost pure milk. By this time, however, a mixed dietary is preferred. Milk is very deficient in iron. An infant comes into the world with a high percentage of hemoglobin; this gradually diminishes so long as he is fed on milk alone. Only when a mixed diet is substituted for a pure milk diet does the percentage begin to rise again. Cereals and meat juice and broths are rich in iron. Oatmeal is amongst the richest in iron of the cereals, and properly cooked forms a useful addition to the infant's dietary. Shortly after the first twelve months eggs lightly cooked may be permitted at one of the meals in the day. The great richness of the yolk in fat, lime salts, and in the organic compounds of phosphorus and iron, makes it a valuable food for the rapidly developing child. At this period, also, food involving somewhat long mastication, such as biscuits and crusts of bread, becomes necessary. The process of mastication develops the maxillary bones and the associated muscles, while disuse of the jaws starves the area supplied by the maxillary arteries, leading to their imperfect development. The bone remains small, the teeth are crowded and imperfectly nourished, and dental caries, so disastrous to the growing child, becomes inevitable.

Empyema in Children.—COTTER (*Boston Medical and Surgical Journal* of July 17, 1902) in an extended study of this condition draws the following conclusions: (1) Empyema in children usually follows lobar pneumonia—after a varying interval. (2) The infection is usually with the pneumococcus. (3) Spontaneous cure, even when aided by tapping, is rare. (4) Operation should not be delayed, as time lost is strength lost, and the issue is largely one of nutrition. (5) The best form of operation is in general the subperiosteal resection of an inch of the eighth or ninth rib in the posterior axillary line, the evacuation of pus and fibrin masses, and tube-drainage. (6) Irrigation at or after operation is not usually advisable. (7) Routine after-treatment in fresh cases should be tube-drainage, the tube being progressively shortened, and removed when the cavity is nearly healed. (8) Where failure to heal seems to depend on failure of the lung to reëxpand, treatment by valve or suction apparatus is indicated. This is especially of value in the more chronic cases. (9) The mortality is about one in seven; in small children it is much greater than in those over five years. The causes of mortality are, in the main, beyond our control. (10) The great majority of cases heal even when the healing is delayed for many months. Chronic empyema, in the strict sense, is rare in children. (11) The closure of the cavity depends mainly on nutrition and on adequate drainage. (12) Recurrence may take place from faulty drainage at any time, and it may occur years after apparently sound healing, without obvious cause. (13) Deformity of the chest is usually temporary and yields to treatment. (14) Long-continued discharge from the cavity is not infrequently followed by chest deformity, and scoliosis of a severer type, permanent, and sometimes extremely severe.

Report of Ninety Cases of Typhoid Fever in Infants and Children.—Abt (*Medical News,* November 1, 1902) contributes his results in ninety cases of typhoid fever in children, and concludes his remarks by saying that the treatment which he employed was the same that is everywhere in vogue. It may be divided as follows: (1) Hygienic; (2) dietetic; (3) hydrotherapeutic; (4) expectant and symptomatic. A large portion of the cases ran the entire course of the disease without receiving any drugs. Patients were kept in bed and as quiet as possible, although they were encouraged to change their position in bed frequently. This enforced rest in bed could not be strictly adhered to in young children. It was necessary to pick them up on account of restlessness, or to change their napkins, and for their baths. The mouths were kept scrupulously clean by washing with boric acid solution. The usual precautions were practiced concerning the prevention of bed-sores.

Only a few visitors were allowed in the ward at a time, and if a number of patients were ill visiting was abolished. During the febrile period the patients were kept on a liquid diet, consisting almost exclusively of milk, except in those rare cases where milk could not be borne. After the temperature had fallen to normal, strained gruels, broths, and fruit juices were permitted. The patients were all encouraged to drink large quantities of water. No solid food was allowed until the tenth day of normal temperature.

The treatment of the fever was carried out on the hydrotherapeutic plan. His experience soon taught him that children bore cool baths badly—that is to say, baths in which the water was reduced to a temperature as low as 70 deg. or 75 deg. F. The children who were thus bathed lived in constant terror of the succeeding bath. They were nervous and unhappy. In consequence of this they were restless; the pulse and respirations were accelerated. Not only this, but those patients who were given cool baths frequently reacted badly. They were literally forced into the water and retained there against their will; not a few of them chilled; many of them were somewhat cyanotic and excited after being replaced in bed. As is the custom generally, the little patients were bathed for a temperature of 103 deg. F. They were carried from the ward into the adjoining bath-room, and were placed in the tub, with water at a temperature of from 88 deg. to 90 deg. F.

The bath was so arranged that a hammock was suspended over the tub, and when the child was introduced into the bath it reclined comfortably on the hammock. It was found that in nearly every case if the child were allowed to remain in the tub for five minutes in water at 90 deg. F., the bodily temperature was reduced two degrees, and the pulse and respiration fell a corresponding number of points. The children were continually rubbed while they were in the baths; they experienced no chills, no discomfort; they enjoyed them and looked forward to them. In those cases where the fall of temperature was unsatisfactory, or where the fever was unusually high, it was found that by leaving the children in the bath for ten or twelve minutes a greater reduction of temperature could be obtained. It was noted as a point of interest that the bath-water was usually raised two degrees—that is to say, water that was 90 deg. F. when a child was placed in it was raised to 92 deg. F. before the bath was finished. No antipyretic drugs were employed to reduce the temperature in any case. In those cases showing nervousness or restlessness, an icebag applied to the head sometimes gave relief. At times a small dose of Dover's powder or sodium bromide was given for restlessness and sleeplessness.

Constipation was treated by enemata, and cases of severe diarrhea were given small doses of deodorized tincture of opium. In the prolonged cases which showed the exhausting effects of the disease, where the pulse was rapid and weak, whiskey or brandy was employed and moderate doses of strychnine were given. A child ten years of age was given 1-100 of a grain three or four times a day. A child three years of age was given 1-200 of a grain of strychnine three or four times a day. Intestinal antiseptics were rarely employed.

It is unnecessary to go further into detail concerning the various complications and conditions which arose and required special attention. Such complications and conditions were treated as they arose, on a rational plan. At the close of the febrile period patients were freqently given a tonic, in a routine way, the favorite being the elixir of iron, quinine, and strychnine.

PEDIATRICS

Vol. XV. MARCH, 1903 No. 3

ORIGINAL ARTICLES

A CASE OF INFECTION WITH THE DOUBLE-PORED DOG TAPEWORM (DIPYLIDIUM CANINUM) IN AN AMERICAN CHILD.

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Among the specimens of parasites recently sent to the Bureau of Animal Industry for examination is one (B. A. I., No. 3,305) which is of considerable interest. This is a double-pored tapeworm which was passed by a child, and which belongs to the species *Dipylidium caninum*, a very common parasite in dogs and cats, but comparatively rare in man. According to Dr. George Duffield, of Detroit, Mich., to whose courtesy we are indebted for this specimen, the worm was discharged by a child sixteen months old.

The parasite in question belongs to the family Tæniidæ, subfamily Dipylidiinæ, and is characterized as follows:

SUBFAMILY DIPYLIDIINAE STILES, 1896.

Subfamily Diagnosis.—Tæniidæ: Suckers unarmed. Rostellum armed, rarely absent. Genital pores lateral, single, or double and opposite. Genital organs of each segment in single or double series. Uterus usually divides up into egg sacs, or disappears entirely so that the eggs lie free in the parenchyme. Eggs with thin transparent shells, with or without appendages. Larval forms (cysticercoides) in arthropods or mollusks. Strobila in mammals, birds, and reptiles.

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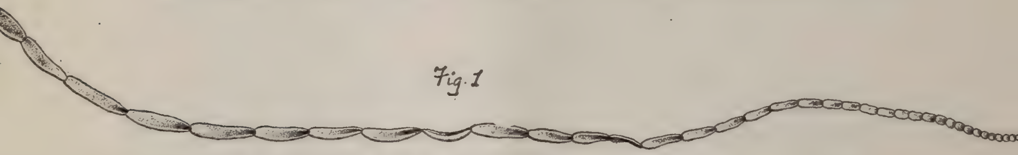
[1] Compliments *American Medicine.*

Type genus: *Dipylidium* Leuckart.

GENUS DIPYLIDIUM[2] LEUCKART, 1863.

Generic Diagnosis.—Dipylidiinæ: Rostellum retractile, armed with several rings of alternating hooklets which usually possess a discoidal base. Suckers unarmed. Genital pores double and opposite. Genital organs in double series. Testicles very numerous, in median field. Ovary bilobed. Vitellogene glands distal of ovary. Uterus at first represents a reticulum, in the meshes of which are situated the testicles; later it breaks up into egg-sacs or several eggs. Eggs with double shell. Adults parasitic in mammals.

Fig. 1



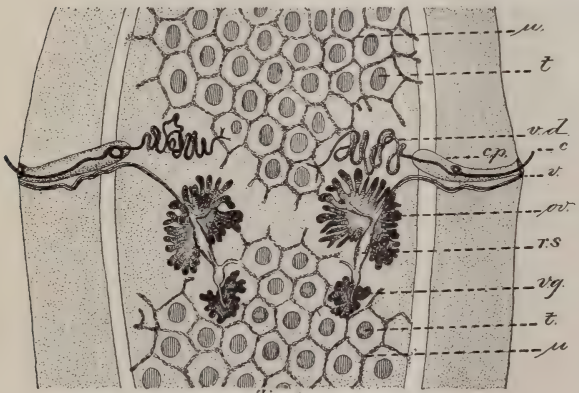


Fig 2

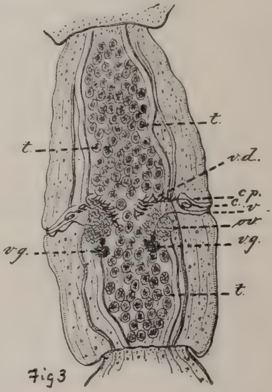


Fig 3

Fig. 1.—Adult strobila of the double-pored dog tapeworm (*Dipylidium caninum*). Original.

Fig 2.—Mature segment of same, showing the anatomy: *c.*, cirrus (penis); *c.p.*, cirrus pouch; *ov.*, ovary; *r.s.* receptaculum seminis; *t.*, testicles; *u.*, uterus; *v.*, vagina; *v.d.*, vas deferens; *v.g.*, vitellogene gland. x25. After Neumann in Railliet, 1893, page 289, Fig. 188.

Fig. 3.—Gravid segment of same, lettering the same as in Fig. 2. After Diamare, 1893, pl. 1, Fig. 1.

Type species: *Dipylidium caninum* (Linnaeus).

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[2] Synonyms: *Dipylidium* Leuckart, 1863; *Microtaenia* Sedgwick, 1884.

DIPYLIDIUM CANINUM[1] (LINNAEUS, 1758).

Specific Diagnosis.—Dipylidium: Strobila 15 to 35 cm. long; head small, globular; rostellum club-shaped, with 3 to 4 transverse rows of hooks (about 60 in number) of rose-thorn form; the anterior hooks 15 microns; the posterior hooks 6 microns; suckers relatively large, rather elliptical. Segments 80 to 120 in number; gravid segments 8 to 11 mm. long, 1.5 to 3 mm. broad, often reddish brown in color. Genital pores at equator or in posterior half of segment; uterus forms egg-capsules, each containing 8 to 20 eggs; eggs globular, 43 to 50 microns in diameter; eggshell thin; oncosphere 32 to 36 microns.

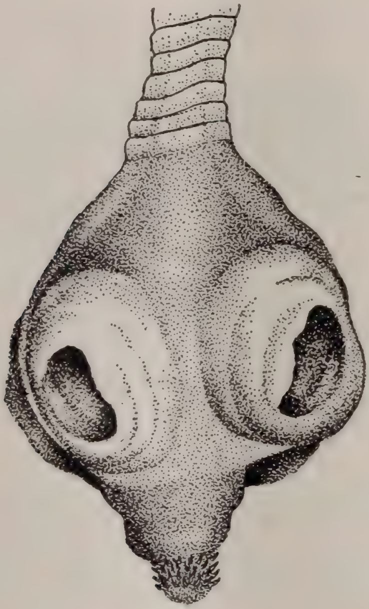

Fig. 4.—Head of same, showing four rows of rose-thorn hooks on the rostellum and four unarmed suckers. Original.

Hosts.—Adult in dogs, cats, and man; larva in lice (*Trichodectes canis*) and fleas (*Pulex serraticeps, P. irritans*).

While this is one of the smaller tapeworms, it cannot be looked upon as harmless, for it sometimes burrows into the intestinal

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[1] Synonyms: *Taenia canina* Linneaus, 1758; *T. moniliformis* Pallas, 1781; *T. cucumerina* Bloch., 1782; *T. elliptica* Batsch, 1786; *T.* (*Dipylidium*) (Linnaeus) Leuckart, 1863.

mucosa making a tunnel-like channel, through which the segments are pulled much like a train of cars passing through a tunnel.

Clinical Diagnosis.—In diagnosis, search should be made in the feces for the peculiar elongated elliptical tapeworm segments. Microscopic examination of the feces for eggs is less certain than in case of infection with *Taenia saginata, T. solium,* or *Dibothriocephalus latus*, since *Dipylidium* is much smaller and less prolific than any of these three forms.

The eggs of *Dipylidium caninum* are entirely different from those of any *Taenia.* In the genus *Taenia* we find a thick striated inner shell (embryophore), while in *Dipylidium* the inner shell is thin. The six-hooked embryo, characteristic of all tapeworms, is observed in the egg.

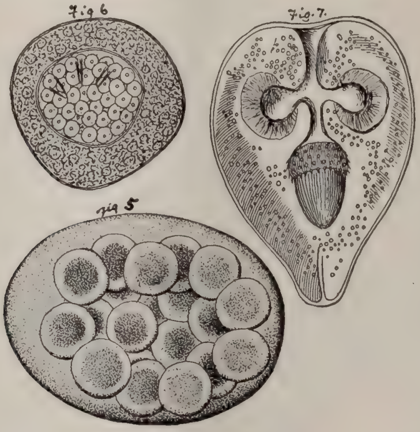

Fig. 5.—Egg packet of same. Greatly enlarged. Original.

Fig. 6.—Egg of same. Note the six hooks in the embryo. Greatly enlarged. Original.

Fig. 7.—*Cryptocystis trichodectis,* the larval (infection) stage of *Dipylidium caninum* as found in the flea. After Leuckart, 1886, page 847, Fig. 348.

Physicians who wish to become familiar with *Dipylidium caninum* can easily obtain specimens by examining several cats or dogs, as this tapeworm is very common in these animals. For a zoological discussion and bibliography of the genus *Dipylidium,* the reader is referred to Diamare, 1893, Il genre *Dipylidium* Lt. (Atti R. Accad. fis. e mat. di Napoli, 2. s., v. 6 (7), presentata 13 maggio, 1893. Reprinted as separate, 31 pp., pls. 1-3, with 50 figs. 4°. Napoli, 1893.)

OBSERVATIONS ON THE MICROORGANISMS IN THE WATER OF PUBLIC SWIMMING BATHS, AND A SUGGESTION.[1]

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It is a matter of common observation that the water in public swimming baths becomes turbid towards evening, especially if the number of bathers has been great. I often used to speculate whether this turbidity was associated with a definite increase in the number of bacteria.

Last summer and autumn, by permission of Dr. Hope, I was able to make several observations on the microorganisms present in the water of the various Liverpool Swimming Baths at different periods of the day.

I have ventured to give you a brief summary of these observations, believing they are of scientific interest, and possibly of slight practical value.

Attention was directed to the following points:—

1. The total number of bacteria present in the water of first and second class baths at the beginning and end of the day.

2. The number and nature of pathogenic organisms present.

3. The source of the organisms.

4. The possibility of contracting infectious or other diseases from the water when dirty.

It is necessary to describe briefly the methods adopted.

(*a*) Samples of water, which had been previously well stirred, were collected in sterilized flasks, care being taken to avoid contamination with solid particles floating on the surface.

(*b*) Each sample was taken to the laboratory, diluted with a known quantity of sterile water, plated on three or more agar plates.

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[1] Reported to the Liverpool Medical Society.

(*c*) In order to prevent the possibility of the bacteria in the sample of water multiplying, each sample was always plated within an hour of the time when it was taken from the baths—usually at 8 a.m. in the morning or at 10 p.m. at night.

(*d*) The agar plates were incubated at 37 degrees C. for 48 hours. The number of colonies per plate was counted, and by striking an average, the number of bacteria present in a cubic centimeter of the undiluted bath water was calculated.

(*e*) The agar plates were incubated at 37 degrees C., that is to say, at blood heat, because this temperature tends to destroy or inhibit the growth of moulds and other organisms which, being accustomed to live at a low temperature, are therefore more likely to be derived from the water itself than from the bodies of the bathers.

(*f*) The number of coli present in the water was also calculated, for these organisms are a rough index of fecal contamination. It is by no means a simple task to identify colonies of coli on an agar plate containing many colonies of various other organisms. Fortunately I was able to employ bile salt agar, a medium synthesized by Dr. MacConkey, while working at the Thompson Yates Laboratory.[1] Colonies of colon bacillus have a most characteristic appearance on this medium, and their identification is a comparative easy matter.

The majority of the observations were made at Cornwallis Street, because the baths are filled with clean water every morning, which is always derived from the same source. The Cornwallis Street Baths are always closed at 9 p.m., the water emptied out by 10 p.m., the sides are then washed, and at 11 p.m. fresh water for the next day commences to run in. By 6 a.m. the bath is full and the public are admitted. The temperature of the water throughout the night and day is practically the same, namely, 70 degrees F.

Now, the water used to fill the bath being well filtered contains less than three bacteria per c.c., and is therefore practically sterile; but after entering the bath it is contaminated with bacteria adhering to the floor and sides, and by others dropping in from the air. Samples of clean water taken about 7 a.m. on three occasions gave an average of 46 bacteria per c.c., the highest figure being 61 per c.c. As the bacteria in the water would tend to gravitate to the bottom of the bath during the night, samples were not taken until the water had been well stirred by one or two bathers.

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[1] Alfred MacConkey on Bile Salt Media, Thompson Yates Laboratory Reports, vol. iii. part 1.

I am convinced, for reasons to be presently stated, that the bacteria present in the early morning are derived mainly from the air and partly from the walls of the bath, and that their multiplication during the night is slow. If, therefore, the bacteria increase from 3 to 46 per c.c. in the eight hours of the night, then, supposing no bathers contaminated the water, the total number of bacteria in the bath by nine o'clock the next evening, allowing for slight multiplication, would not be more than 200 per c.c., a very liberal estimate, as will be seen later on. The examination of the water in the first-class plunge bath at 9 a.m., on five different occasions during the months of June and July, gave an average of 4,676 bacteria per c.c., the average number of bathers being 292. Again, samples collected in the second-class baths on three separate occasions contained an average of 11,970 per c.c., the average number of bathers being 186.

We have seen that the water in the first-class bath contains 46 bacteria per c.c. in the early morning, and we have argued that if no bather contaminated it, the number in the evening would have reached about 200 per c.c. We have also seen that after 292 persons had entered the water, the number of bacteria rose to 4,676. That is to say, those 292 bathers were collectively responsible for about 4,400 bacteria per c.c., and individually responsible for 15 bacteria per c.c., or 15,000 per liter. But did each bather really shed into the water 15,000 bacteria per liter, or is the increase mainly due to multiplication during the day of bacteria already present in the bath?

Now, it will be remembered that we are only estimating bacteria which grow at 37 degrees C., and not those which grow at 21 degrees C., the temperature of the water in the bath; so it is probable that they would not multiply very rapidly during a few hours in cold water. Again, fully two-thirds of the bathers enter the bath during the latter half of the day, so that bacteria introduced by them would not have much time to multiply, even if they wished to.

In order to determine whether bacteria carried into the water by the morning bathers had multiplied appreciably by the evening, the following experiment was performed.

About midday I collected in a sterile bottle 100 c.c. of water, already contaminated by several bathers, and at once poured 10 c.c. of this water in a sterile test-tube. The bottle with the remaining 90 c.c. having been tightly corked with a sterile glass stopper, was sunk to the bottom of the bath, and left there till 9 p.m.

By immediately plating a sample of the water in the test-tube, I ascertained eventually the number of bacteria present in a cubic centimeter of the water in the bottle at midday. It is clear, as the bottle was sunk in the bath, that the organisms in it were subjected to the same conditions of light and temperature as the rest of the organisms in the bath. If the organisms introduced into the bath before noon multiplied by 9 p.m., then the organisms in the bottle would also multiply, and the rate of multiplication could be calculated. Samples from the bottle were taken at 9 p.m., and the number of bacteria per c.c. in them was ascertained. The number of bacteria per c.c. in the bath water itself on that particular night was also found.

These observations were repeated on four different occasions, and gave the following average result:—

Water in the bottle at midday— 902 bacteria per c.c.
Water in the bottle at 9 p.m.— 972 bacteria per c.c.
Water in the Bath at 9 p.m—4355 bacteria per c.c.

That is to say, that the bacteria which grow on agar at 37 degrees C. introduced into Cornwallis Street Baths before noon only multiply slightly by evening. The action of daylight, the low temperature and the constant agitation of the water are unfavorable to rapid multiplication. The following observations confirm the view that the multiplication of the bacteria in the water is slight. The water in the first-class bath on a Sunday morning was almost clean at 6.15 o'clock and contained about 40 bacteria per c.c., but during the next three hours 120 persons bathed in it, and the number of bacteria at 9 o'clock was 1,540 per c.c. Three hours is too short a time for such multiplication to occur.

Again, in the latter half of October, when the bathers were few, the number of bacteria present in the bath rarely exceeded 700 per c.c.[1]

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[1] In the Lodge Lane Baths, under certain conditions, a bacillus or group of bacilli appear which multiply rapidly, so that the total number of organisms present may reach 20,000 per c.c. Observations are further complicated by the fact that the water is derived from different sources; and as the number of bathers is relatively small, the bath is not emptied every day.

To recapitulate: Taking the average of five observations on separate days, it was found that the number of bacteria per c.c. in the water at night was 4,676; deducting 200 for those already present in the bath and 400 for multiplication, we find that 292 bathers introduced in round numbers 4,000 bacteria per c.c. Therefore each individual introduced 13.7 bacteria per c.c. Now, the capacity of the first-class bath is 70,000 gallons, roughly 300,000,000 c.c. Therefore the water removed from the skin and hair of each bather in about ten minutes approximately 4,000,000,000 germs.

Truly it is a great and glorious thing to wash, even in a swimming bath, and without soap!

In the same way the capacity of the second-class bath being roughly 100,000,000 c.c., each bather contaminated the water with 6,000,000,000 bacteria. Now, the bathers in the second-class are mainly small boys, and the amount of hair and number of square inches on their bodies must be nearly half that of the older and bigger bathers in the first-class. Therefore it appears that the skin of a small boy in the second-class is at least twice as dirty as that of the more respectable bathers in the first-class. One has only to see the small boy before and after bathing to be convinced that this bacteriological deduction is substantially correct!

The colossal figures just mentioned are rather appalling, but I am convinced of their accuracy; and one has only to reflect that bacteria swarm on the hair, on every particle of epidermis, and in the mouth of every sweat gland to realize that the total number upon the human body must necessarily be enormous, and from an hygienic point of view, washing is an art to be encouraged.

While it is impossible to markedly diminish the number of bacteria carried into the bath without compelling each person to use soap before bathing, yet there is a source of pollution which might easily be avoided. Let me explain.

Between the edge of the bath and the dressing-boxes there runs a tiled corridor about four feet wide. Along this corridor, which is usually soaked with water, dripping from the bodies of the bathers, fully dressed persons are constantly walking, and unconsciously washing the soles of their dirty boots. Thus in a short time the surface of the corridor is black with dirt carried in by the boots from the streets. Meanwhile, bathers are also perpetually walking along this corridor in their bare feet, and carrying the filth from it into the bath. The state of the corridor is worse in the evening, when every box is occupied, when persons are standing about waiting for an empty one, and when the attendant is too busy to be constantly washing the dirt off its surface. I counted one night eighty people walking over a square yard of the corridor in their dirty boots in the space of forty minutes. Let anyone who doubts the truth of my statement go when the baths are full; let him walk along the corridor in his bare feet, wipe his feet on a towel, and then examine the towel; or let him wash his feet in clean water and then examine the water, and he will find it turbid, and containing fragments of straw, horse-hair, and other dirt derived from the sweepings of the streets. I examined the sediment which had collected in the gutter at the side of the corridor at Lodge Lane first-class bath, and found that it contained over 300,000,000 bacteria per c.c. The following experiment was performed to estimate approximately the number of bacteria which might be carried into the bath from the dirty corridor by the feet of the bather. A boy, after swimming about the bath, came out and stood on the corridor. I asked him to rinse his feet in 500 c.c. of water containing a known number of bacteria, and then calculated the number of bacteria introduced by the dirt on his feet, and found that had he dived into the bath he would have carried in some 80,000,000 organisms at least. I repeated this observation several times with my own feet, and found the number of bacteria deposited on the soles varied, according to circumstances, from thirty to over a hundred million.

When the water is still, this material deposits itself in patches at the bottom of the bath, and is often visible to the naked eye. I also collected some of the deposit when the bath was being emptied, and found it had substantially the same composition as that obtained by experiments with the bathers' feet.

I am convinced that a large amount of street dirt is needlessly carried into the bath by the feet of the bathers, especially in certain old-fashioned baths like the Pierhead, where the corridor is of wood and smooth. Organisms carried with such dirt are more likely to be injurious to the bathers than those derived from their own skins. Thus the bacillus of tetanus is common in horse-dung, and tubercle bacilli are constantly expectorated upon the street pavements.[1] Although the number of these organisms introduced into the bath is probably too small to be harmful, yet on general principles their introduction is most undesirable.

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[1] H. E. Annett, "Tubercular Expectoration in Public Thoroughfares," Thompson Yates Laboratory Reports, vol. iv. part 2.

The ideal bath would have two corridors, an inner one between the bath and the boxes, a second outside the boxes, and the boxes would be open back and front. No one would be allowed to walk on the inner corridor unless he was barefooted, and no one to walk on the outer corridor unless he had boots on. To construct a bath on this principle, with two corridors instead of one, would mean an increased initial expenditure, but would pay in the end; the water would be cleaner, and therefore more healthy.

There is no need to name the organisms present in the contaminated water; yeasts and sarcinæ were common, but moulds rarely grew, as the temperature of incubation was too high. I never succeeded in discovering streptococci, perhaps because the colonies are small and difficult to identify, but most probably because the streptococci are delicate and short-lived organisms, and one would not expect to find them in the bath. *Staphylococcus aureus* and *citreus* were very rare, and totally absent in the vast majority of plates examined, even though the plates were kept for a week or more, in order that the colonies, if present, might develop their characteristic color, and thus be easily identified. White staphylococci were present in large numbers, and comprised three varieties, *Staphylococcus pyogenes albus, Staphylococcus epidermidis albus* of Welch, and *Staphylococcus cereus albus.* A rough idea of the frequency of staphylococci in the water at the end of the day may be gathered from the following observations:—

Five agar plates contained a total of 101 superficial colonies; 23 of these proved to be staphylococci—11 *Staphylococcus cereus albus,* 8 *Staphylococcus pyogenes albus,* 4 *Staphylococcus epidermidis albus.*

Bacillus coli was present in the bath at the end of the day—2.156 per c.c. in the first-class and 8.9 per c.c. in the second-class. It was always absent in the clean water. It could not have dropped in from the air.[1] Its presence is an indication of fecal pollution from material which was derived mainly from the bodies of the bathers, but as I found in small part also from the fragments of horse-manure which being deposited on the surface of the corridor were carried into the bath. The bacillus multiplied slightly in the water during the day. The number of coli carried in by each bather in the first-class was 2,400,000, in the second-class 4,800,000. This fact is of practical value with regard to the possibility of bathers contracting typhoid from swallowing contaminated water. For, supposing a bather was suffering from ambulatory typhoid, he would contribute about 8 colon bacilli per liter in the first-class bath in Cornwallis Street, or 48 per liter in the second-class, but the number of typhoid bacilli contributed, for persons which I need not state, would probably be much less than 8 or 48 per liter respectively, so that a bather would require to drink pints of water before he swallowed a single typhoid bacillus; moreover, I doubt very much whether anybody contracted typhoid from swallowing one or even half a dozen typhoid bacilli. In other words, I believe that one bather with typhoid would not introduce sufficient typhoid bacilli into a swimming bath to infect other bathers, even if they swallowed several mouthfuls of the water.[1]

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[1] Harriette Chick, "Distribution of Bacillus coli communis," Thompson Yates Laboratory Reports, vol. iii. part 2.

Is swimming-bath water, containing several thousand of bacteria per c.c. mainly derived from the human body, injurious or likely to be injurious to those bathing in it?

It must be remembered that such water would contain not only bacteria and their toxins, but also organic waste products secreted from the skin of the bather, which are probably far more poisonous than the former. The injurious effect, if any, of bathing in dirty water would largely depend on the quantity and the nature of the bacteria swallowed. Drinking water rarely contains more than 50 bacteria per c.c., and 300 bacteria per c.c. probably represent the highest limit of safety, not because the bacteria are themselves harmful, but because their presence is an indication of sewage contamination. The number of organisms in fresh water, river or lake, unless there has been extensive sewage contamination, is considerably less per c.c. than in a first-class swimming bath at the end of a summer's day.

The Thames at Hampton Court contained, when tested by Frankland, only 1,437 bacteria per c.c. I examined the sea water at Hoylake at high tide—you know it is muddy enough—and found it contained remarkably few bacteria per c.c., though the percentage of coli present was relatively high.

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[1] Fortunately in Liverpool there is no need to consider the possibility of multiplication of typhoid bacilli, as the water is frequently changed. There is a bath in the Midlands which was formerly emptied once a fortnight; now they do better, and empty it once a month!

There are certain healthy persons accustomed to bathe in open air, who always feel tired or stupid after swimming in a public bath. I do not believe this feeling of lassitude is due to the fact that the water in the bath contains multitudes of microbes. I think it is partly because the temperature of the water is often too high, but mainly because baths are frequently badly *ventilated.*[1] Nevertheless, I think there could be no reasonable doubt that if the inhabitants of Liverpool suddenly made a practice of drinking the dirty water from the second-class public swimming baths, though they would not contract typhoid, yet their general health would be impaired, their resistance to disease lessened, and they would often suffer from dyspepsia or gastro-intestinal irritation.

On the other hand, I think that a bather might swallow an occasional mouthful of bath water swarming with bacteria with impunity.

But even if bacteria are always absolutely harmless, yet their presence in large numbers proves that the water is not clean—to put it mildly—and *cleanliness is the essence of hygiene.* Clean water, moreover, attracts swimmers; and as swimming is an exercise peculiarly suitable for busy town dwellers, it should, in the interests of public health, receive every encouragement.

In Liverpool, at any rate, the authorities, recognizing this important fact, have provided numerous swimming baths, and I hope that those erected in future will possess double corridors.

In conclusion, I should very much like to hear whether any of the members present here have met with cases of tonsillitis, gastritis, diarrhea, scarlet fever, measles, or any other disease which they attributed to bathing in public swimming baths.

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[1] The great importance of thorough ventilation in swimming baths, gymnasia, public ballrooms and other buildings in which violent physical exercise is taken is usually overlooked.

NOTE ON THE SALT STARVATION PRINCIPLE IN EPILEPSY TREATMENT BY BROMIDES

By L. Pierce Clark, M.D.,
NEW YORK,

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I should like again to urge the importance of the hypochlorization diet treatment in conjunction with the bromides and organic bromine salts. Most epileptics are very fond of table salts as well as other ingredients of high seasoning. Many of them eat as much as three or four hundred grains of salt per day; consequently the body tissues are highly saturated with the chlorides. By undersalting or withdrawing salt from the epileptic diet, we reduce the sum total of chlorides in the body. It has been found by experimenting on animals and man that bromine can replace chlorine in the body tissues; therefore by sodium chloride starvation and the continual administration of the bromides, we get an organic bromide compound acceptably fulfilling the physiological rôle of chlorine and at the same time acting as a therapeutic agent of sedation in epilepsy.

This principle is not new; indeed, the idea was first brought forward by Hughlings Jackson in 1868, under the name of "substitution nutrition," but it was first actually applied to the treatment of epilepsy by Toulouse and Richet three years ago, and has since been used successfully abroad and in this country to some extent. I have used the plan in a modified form very extensively for the past three years, both at the Craig Colony and in private practice.

Ordinarily we know the dosage of bromide sufficient to control epileptic seizures is from 60 to 160 grains, but under the salt starvation method 20 to 60 grains is just as efficacious. The lowering of the dosage means a lowering of the possible toxicity from the drug, with its well known attendant evils upon mind and body.

Then, too, the economic feature of the plan is obvious, as bromide sedation in epilepsy as well as in other neuroses must often be continued for several years.

It is especially to be recommended in those acute idiopathic cases which require such large doses of bromides given in the ordinary manner that fatal intoxication is imminent; in those in which even unusually high dosage of bromide is of little value; in those totally intractable to the bromide salt; and, finally, in all chronic cases where a long continued sedation is necessary to hold in partial check the severity and frequency of epileptic attacks. The dietary should be especially arranged for palatableness, and consist of cereals, milk and vegetables. The bromide of sodium should be given in the patient's food in place of table salt, as it is nearest like it in point of taste.

Quite recently I have employed organic bromine in emulsion; especially in epileptics of poor physique this preparation more or less entirely replaces the bromide salts in the hypochlorization diet treatment.

These new principles, however, do not obviate the necessity of constant use of hydropathy, massage, and general hygienic treatment.

In general, I may say that the results I have obtained from hypochlorization diet and the bromide treatment of epilepsy are the absence of "bromism," gastric irritation, constipation, and the mental hebetude common in the older forms of bromide sedation.

I certainly believe that the hypochlorization adjuvant principle is the greatest therapeutic advance since the discovery of the bromides.

Courtesy of *New York Medical Journal.*

TWO CASES OF CAESAREAN SECTION.

By Arthur J. Wallace, M.D.,

OF LIVERPOOL.

ASSISTANT SURGEON, HOSPITAL FOR WOMEN, LIVERPOOL.

The operations on these patients were performed just a year ago, the first on Good Friday, 1901, the second on the following day, an experience which is unusual in this country.[1]

Case I.—Early in April, 1901, Dr. Llewellyn Jones, now of Dolgelly, but at that time assisting Dr. Wynne Griffith of Pwllheli, wrote to me concerning a woman aged thirty-nine, whose first pregnancy was complicated by the presence of a pathological swelling in her abdomen. On April 4th Dr. Griffith himself brought the patient to Liverpool. Her history was vague. Menstruation had always been normal until it ceased in 1900, but the patient merely had the impression that the last period had occurred in June, and she had never noticed any fetal movements. She was an undersized, anemic person, with a very prominent abdomen. The enlargement was unequal, an obliquely coursing sulcus separating the pregnant uterus from a smaller swelling on its right. This swelling extended from the upper border of the symphysis pubis to three inches above the umbilicus; it fluctuated distinctly and was almost immobile. No souffle could be detected over it. The uterus was displaced to the left, and its size indicated that full term was at hand. A fibroid about the size of a man's fist sprang from the fundus, and the uneven surface of the anterior wall pointed to the existence of smaller ones. The fetal parts were only vaguely distinguishable, and the consequent suspicion of an anteriorly attached placenta was supported by the loud roaring souffle heard on auscultation.

Vaginal examination disclosed a further complication. The pelvis was flattened, its diagonal conjugate measuring but two and one-half inches. The cervix uteri lay high up on a level with the brim, and pushed close to the left pelvic wall by the right-sided swelling which roofed in more than half of the pelvic cavity. That it was an intra-ligamentous fibroid seemed probable, and its position and relations would have made doubtful the possibility of delivery through a normal pelvis : the added deformity made surgical interference imperative.

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[1] Denman, in his *Introduction to Midwifery*, 5th ed., 1805, says:—"It is remarkable that the oldest physicians or surgeons in London could not recollect a case of this operation, or had heard it spoken of by their predecessors; yet that two cases, in the same street, should have occurred to one gentleman, within a very short space of time."

The patient was admitted to the Hospital for Women for the Cæsarean operation. About 10 o'clock the same evening uterine contractions began to occur, but in an intermittent fashion, and without effecting much dilatation of the cervix. Next morning (Good Friday), although the cervical canal had been taken up into the general uterine cavity, the external os only admitted the forefinger.

Without delay the abdomen was opened. Neither fibroid nor uterus would budge an inch, so the latter was incised one inch from the line of junction, the incision just striking the placental edge. The fetus lay in the fourth breech position : it was extracted, and after the lapse of a few minutes separated and handed over to Dr. Inman's care. It is noteworthy that the fetus had not made any attempt to breathe so far.

After the removal of the placenta and membranes the uterus was drawn out of the abdomen as far as possible and its relations with the fibroid were explored. The latter occupied the whole of the right broad ligament, and was intimately and extensively connected with the uterus. Removal implied enucleation of a large portion of the growth, and therefore profuse hemorrhage from the venous plexuses of the broad ligament, all deeply congested by the existence of pregnancy. The risks were more than the condition of the patient justified, and the decision was therefore come to, to be content with the section for the time, and to leave to a future date supra-vaginal amputation of the myomatous uterus.

The uterine wound was closed by silk sutures—a deep interrupted layer through muscle only, and a continuous peritoneal layer.

After an uneventful recovery, the patient left hospital at the end of the fourth week. The infant is still alive and well.

Mention was made that the child did not attempt to breathe for several minutes after extraction, although there was no indication of asphyxia. Dr. Inman had some trouble in starting respiration, and delay in similar cases has been reported by other operators. The explanation that has been offered is that the Cæsarean child is in a condition of apnea when delivered, and the respiratory center does not act until the hyper-oxygenated state of the blood at birth has become replaced by one sufficiently impure to stimulate it.

The patient conceived again in September, 1901. Two months later the pregnant uterus was successfully removed by supravaginal amputation.

The large fibroid had prevented the uterus from sinking into the pelvis as involution took place, and it was therefore not surprising to find adhesions between uterus and abdominal wall. The latter was in the first instance purposely incised high up and to one side of the old scar, in order to obtain a good view of any adhesions that might exist without disturbing them. They were seen to be arranged in three lines: a median, from the lower end of which, on each side, another line of adhesions ran upwards and outwards, the whole arrangement resembling a V, the angle of which was bisected by a vertical line. This vertical band was about one and three-quarter inches in length, the lateral ones being shorter. It corresponded to the extent of the scar in the uterine wall. The probability is, therefore, that the whole of the four inch uterine incision had become adherent to the abdominal wall immediately after the Cæsarean operation. Had the second pregnancy been allowed to progress to full term, the scar, judging from the reports of repeated sections, would again have increased in length *pari passu* with the expansion of the uterine wall. Whether the bands of adhesions would have correspondingly lengthened cannot definitely be affirmed, although the results in other cases favor the probability. In that case a second Cæsarean would have been possible without opening the peritoneal cavity, as has been recently done by Dr. W. J. Sinclair of Manchester.

The operation was free from difficulty, the adhesions, tough though they were, giving no trouble during the process of separation. The patient made an excellent recovery and returned home at the end of four weeks.

Case II.—The second patient was a primipara aged twenty-seven. She was eight months pregnant when labor began on April 3rd, 1901. It went on fitfully and with but little progress until the early morning of the 6th, when the district midwife in attendance summoned assistance, and Dr. Inman, the obstetric assistant to the Lying-in Hospital, saw the case. He at once recognized its gravity, and sent the patient into hospital. Soon after admission the membranes ruptured.

The woman was manifestly weakly and had a cachectic appearance, due, by the light of subsequent events, to syphilis. Her stature was stunted, and hip-joint disease in childhood had led to shortening of the left leg to the extent of two inches. The left sacro-iliac joint was in the same condition, the corresponding sacral ala undeveloped, and there was general contraction of the small pelvis.

The pelvic measurements were as follows:—

Anterior interspinous, seven and one-eighth inches.
Intercristal, eight and three-eighths inches.
External conjugate, six and one-sixteenth inches.
Posterior interspinous, two and three-quarter inches.
Conjugata diagonalis, two and three-quarter inches.
Conjugata vera, two to two and one-quarter inches.
Transverse of outlet, two inches.
Antero-posterior of outlet, four inches.

The soft parts were narrow and rigid: the os admitted two fingers only, and the head lay transversely with the occiput wedged into the pelvic brim so that the lower uterine segment was nipped between them.

Cæsarean section was performed, the (median) uterine incision striking the anteriorly attached placenta (placenta prævia Cæsarea). After the latter had been removed with the membranes, the uterine cavity was found to be lined by a layer of greenish-yellow, pulpy material, presumably diseased decidua. It was extremely tenacious, and much time was lost in its removal, which, it is to be regretted, was incomplete. This, however, was not known until trouble had arisen later.

The uterine wound was closed by deep interrupted sutures of chromicised catgut and a superficial peritoneal layer (continuous) of the same material.

On the third day there was some chest trouble, which soon cleared up. But on the eighth day the temperature began to rise, and a small unhealthy sore developed over the sacrum. Next day the temperature was 102 degrees. The lochia were normal, but it was thought advisable to explore the uterus. This was cautiously carried out, and more of the greenish-yellow material was removed from the lower part of the uterus. It was washed out with sterilized water and a light gauze pack introduced. The temperature rose to 103 degrees on the same night, then sank in two days to normal, and recovery took place without further mishap.

The feeble leaden-hued infant developed pemphigus on the sixth day. The rash affected the head and face chiefly, but there were several pustules on the chest. The child was fairly well when its mother was discharged from hospital, but it unfortunately died when three months old.

The woman is pregnant again. She desired to have a child, and has elected to undergo another Cæsarean section rather than have abortion induced at the third month.[1]

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[1] Courtesy of Liverpool *Medical Journal.*

NEW YORK ACADEMY OF MEDICINE.

SECTION ON ORTHOPEDIC SURGERY.

Meeting of January 16, 1903.

T. Halsted Meyers, M.D., Chairman.

Presentation of Cases.—Dr. Taylor presented a child six months old, no history of sickness or injury, who two weeks before was brought to the hospital on account of "snapping of the left knee." On examination it was found that the tibia becomes voluntarily subluxated forward, and was pulled back with an audible snap; this is specially noticeable when the child kicks and cries. The condition was noticed only three weeks ago by the mother. Birth was normal.

Dr. Sayre had seen some similar cases in children eight to nine years old. In his cases, if the leg were supported, the slipping did not occur.

Dr. Whitman had seen a number of such cases as that presented, also others in which the motion occurred in other joints. Last week he observed a child who "snapped" both hip-joints. He thought in the cases of "snapping knee" that the motion of the tibia was usually sideways rather than forward.

Dr. Shaffer presented three cases operated by Dr. Lorenz on December 18, and spoke of a fourth. The first case, a girl aged eight years, had had some little pain for a few days after operation, slight ecchymosis in the inguinal region, otherwise satisfactory. Can go about with a chair but does not walk alone. The second case had been taken home after a week and a half and had done well under those surroundings. The fourth case was satisfactory, and could also get about with support. The other case was also doing well though the child was not present.

Dr. V. P. Gibney presented the following cases:

See table on next page

In regard to the immediate discomfort of the operation, Dr. Gibney said that no patient in the hospital had been obliged to take a narcotic except probably on the first night and then only a small dose. As soon as practicable the cases were fitted with a high shoe and given a chair and allowed to go about the wards.

Walrus Fin.—Dr. Gibney also presented a case of a rare deformity, a reversion of type, as it were, or "walrus fin" deformity, in a child five years old. There was also congenital equino varus of the left foot and equino valgus of the right. It was being kept under observation and the number of bones lacking, the size

SEX	AGE	SINGLE, DOUBLE	PREVIOUS TREATMENT	DATE	OPERATOR
Female	9	Single	None	Dec. 15	Muller
Female	6	Single	None	Dec. 15	Lorenz
Female	7	Single	None	Dec. 15	Lorenz
Female	3	Single	None	Dec. 15	Gibney
Female	3	Double	Stretch, Weight and Pulley	Dec. 16	Whitman
Female	10	Double	None	Dec. 16	Gibney
Female	7	Single	None	Dec. 16	Warren
Female	6	Single	None	Dec. 16	Whitman
Female	7	Double	Stretch, W. and P.	Dec. 16	Whitman
Male	4	Single	None	Jan. 13	Gibney
Female	10	Single	Stretch, W. and P.	Jan. 15	Gibney
Female	11	Single	Stretch, W. and P.	Jan. 14	Warren
			UNSUCCESSFUL OPERATIONS		
Female	10	Single	Exten. bed, W. and P.	Dec. 16	Whitman
Female	10	Single	Exten. bed, W. and P.	Dec. 30	Gibney
Female	12	Double	Exten. bed, W. and P.	Dec. 30	Whitman

of those present and methods of reducing the deformity were being determined. The scapulæ are rudimentary and the arms are in extreme inward rotation; the child can feed herself with difficulty.

Dr. Whitman said that the deformity in this case was in a way accounted for by the fact that the child was evidently in a constrained position in utero. We had seen the patient in the early months of life. It was a breech presentation, the extended limbs were flexed on the abdomen so that its feet were on either side of the head and the arms were fixed between the thighs, the hands being pressed into an attitude of abduction. This attitude could be reproduced for many months. It evidently explained the apparent anchylosis at the knee and elbow joints and the failure in muscular development.

Dr. V. P. Gibney stated that in the case he presented some years ago the hips were dislocated and the arms were in the same position as the case shown. It was also a breech presentation.

Congenital Dislocation of the Shoulder.—Dr. Sayre presented a case somewhat similar to Dr. Gibney's, resembling those reported by Scudder, of congenital dislocation of the shoulder, with twisting of the arm and slight flexion of the wrist. The patient, a boy, had been unable to use the left shoulder since birth. The diagnosis was separation of the epiphysis at the upper end of the humerus which had been unrecognized. The scapula on the left side is also much smaller than its fellow.

Dr. Fiske presented a girl of twelve years, seen November 19, 1902, who, after a fall on the back of the wrist with the hand in extreme flexion showed the condition apparently of anterior dislocation of the carpus. There was no swelling, edema or sensitiveness. With a good deal of force the condition was reduced, and the wrist put in plaster of Paris for three weeks, at the end of which time, when the dressing was taken off, the wrist was in exactly the same condition as before reduction was attempted. Dr. Fiske asked for suggestions as to treatment.

Dr. Whitman presented a case first seen two weeks ago. The patient, a youth eighteen years of age, complained of discomfort in the shoulder. On examination the right upper arm was found to be nearly two inches shorter than the left. Dr. Whitman thought the patient had probably always had more or less discomfort and that the shortening was due to arthritis or epiphysitis in early life. The X-ray showed downward and inward displacement of the head of the bone, as well as shortening of the shaft.

Dr. Homer Gibney presented a case of cured tuberculous disease of the ankle joints in a young child, eight years of age. The treatment was according to his usual method of putting the limb up in plaster and cutting windows in the bandage if suppuration occurred, through which drainage was carried out, followed by the use of apparatus. In the case presented no apparatus was being worn, the child was at home and went about as it pleased.

Dr. Homer Gibney also presented an X-ray of a case of dislocation of the fourth cervical vertebra, in a man who had fallen eight feet. He complained of pain, the head was tipped forward, the chin to the right, the pain was present in both shoulders. The discomfort was great and when seen ten days after the accident in the dispensary, traction was decided upon. He was suspended in the swing for five minutes, and the pain was relieved, and he was able to get his arms above his head in six hours. He was suspended a second time for ten minutes. The symptoms were all relieved and he went back to work. He referred to another case reported some years ago, the patient being a motorman. In some cases a half jacket was applied and in some the Thomas collar was used.

Discussion of the Lorenz Cases, and Other Hip Cases.—Dr. Taylor spoke of three cases operated by Dr. Lorenz at the Post-Graduate Hospital, two single, one double dislocation. They had done well, the shock was moderate and the pain not severe after the first ten days. There was a great deal of ecchymosis and the children have been slow in learning to walk. A symptom presented in the two unilateral cases, and which he thought he noticed in one of the cases shown by Dr. Gibney, was paralysis of the quadriceps extensor femoris. This was explained he thought by forcible stretching of the anterior crural nerve. Dr. Taylor did not think this paralysis was a serious matter, or it would probably be entirely recovered from. He expressed surprise that none of the children operated on a month ago could walk, he did not consider their hobbling about with support or a roller chair as walking.

Dr. Myers thought it impossible to be sure that the paralysis of the quadriceps extensor existed, as in nearly every case the shortening of the ham-string muscles was not fully overcome at the time of operation, and this would prevent voluntary extension of the leg in its new position; moreover the electrical reactions could not be taken as the limbs were still in plaster.

Dr. Sayre reported on two cases operated on by Dr. Lorenz, both of which were in good condition. The case of double dislocation still showed some ecchymosis, as did the case of single dislocation. The children seemed reasonably comfortable, though the unilateral case was as yet unable to walk without assistance.

Discussion of the Case of Walrus Deformity.—Dr. Taylor referred to a somewhat similar case some years ago, where the elbows were anchylosed in extension and the shoulders very stiff. He thought the etiology of these cases was still obscure though Dr. Whitman's explanation threw some light upon it.

Dr. Sayre remarked upon the marked contraction of the flexors of the wrist in Dr. Gibney's case. The hand seemed in a condition similar to that seen in many club hands with deficient bones. The internal rotators of the shoulders were also contracted but the movement at the elbow-joint seemed fair. He thought by constant traction the arms could be brought into good position.

Dr. Gibney mentioned that in the reported case, several years ago, he had corrected the feet and had developed a fair-sized patella, also hip dislocation, which existed, had been reduced and he had secured a little motion at the knee. He had tried holding the shoulders back at various times but it seemed to cause great distress. He said he felt at a loss to know just what to do with the upper extremities.

Dr. Shafer suggested the daily holding of the limbs in position for a longer or shorter time. He did not think good results would follow forced position resulting in breaking of the tissues. Not having carefully examined the patient, however, he could not offer any definite suggestions.

Dr. Dowd suggested the feasibility of elongating the flexor tendons of the hands by operation.

Dr. Sayre thought that a good deal could be accomplished by elongating the flexor tendons and constantly keeping the shoulder back in position. This could be done on one arm at a time to avoid, as far as possible, the great discomfort consequent in immobilizing both arms. He spoke of a case under treatment in which the stretching process was carried out each time as long as the patient could endure it, and a fairly good position was being obtained.

Discussion of Dr. Sayre's Case.—Dr. Taylor said that the case appeared to be one of obstetric palsy with partial recovery. In such cases modeling of the joint's surfaces and subluxation, due to prolonged muscular contractions with vicious fixation of the joint, was occasionally met with. Many of the cases of so-called congenital luxation of the shoulders were probably of this character.

Dr. Whitman referred to the open operation used by Dr. Phelps in contrast to bloodless reduction, stating that the latter was the operation of choice. He agreed with Dr. Taylor that the case presented by Dr. Sayre was one of obstetric palsy with secondary subluxation of the femur. He thought true congenital dislocation was extremely rare. In reducing the dislocation, he proceeded much as in the Lorenz operation for dislocation of the hip. He usually put the arm up in the Sayre position for fractured clavicle, but in some cases had fixed it with the upper arm raised to the level of the shoulder straight from the side. He had only operated on four cases of which two had disappeared from observation. He simply expected to overcome the deformity and to restore the power of supination of the hand, he does not look for restoration of motion at the shoulder-joint.

Dr. Myers said he had several times stretched, under ether, the contracted pectoral muscles in a similar case, but without satisfactory results.

Dr. Sayre had as yet no results, his cases being as yet under observation or had disappeared. He considered the free shoulder motion due to the formation of a new glenoid cavity. He thought as to treatment, that while forcible manipulation was theoretically proper, its results were uncertain.

Discussion of Anterior Dislocation of Wrist.—Dr. Whitman thought this resembled cases of so-called spontaneous subluxation, described by Madelung. The other wrist presented a somewhat similar condition and it might be that the fall had simply exaggerated a pre-existing deformity.

Dr. Sayre said that the lower end of the radius seemed to him to be abnormally shaped. He thought there was a twist in the lower epiphysis of the radius, as if it had been fractured. The cartilage below the ulna was also dislocated. He observed that the child was probably rickety, and that this had a bearing on the treatment.

Dr. Wallace said that he felt pretty sure from examination that the tendon had slipped over the styloid process and this retained the position of deformity. He felt confident that if the tendon were pulled back into place and the wrist fixed long enough there would be no further trouble.

Case of Dr. Whitman—Short Humerus, Arthritis.—Dr. Taylor remarked that he had seen a number of cases of congenitally short humeri; such cases came under the class of phocomelia. This condition had been found in epileptics, and had been classed as a stigma of degeneration. The case presented, however, did not come under this category, as it appeared to be due to previous joint trouble.

Discussion of Dr. H. Gibney's Cases.—Dr. V. P. Gibney said that the case of tuberculous ankle-joint was in keeping with their general results. He spoke of a series of 56 cases which he looked up some years ago with final recovery. It seemed of this series that the joints which suppurated most made the most permanent recoveries.

Dr. Sayre, referring to the case of dislocated cervical vertebra, said he had seen several similar cases with fracture and displacement of the vertebræ with paralysis in one or both arms. After support and the use of a jacket extending to include the head, the paralysis disappeared in a comparatively short time, eight weeks. The head was supportd six to eight months. The deformity had not been entirely relieved.

EDITORIAL

CASTRATION AND MASTURBATION

The foundations of the modern social structure, the maintenance of the family, and the continuance of human life rest on the integrity of the sexual instinct. Its perversion and its misuse are the most virulent factors in the disintegration of the individual and the race. Practically all of the lower animals with penile generative organs masturbate, and it is not to be wondered at that the human child soon learns that pleasure can be found in genital titillation.

Fortunately for most the habit of masturbation is practiced in moderation and when years of reason and control are reached either abandoned or occasionally indulged in.

For the few, however, it proves a curse and in the case of children the pertinent question arises—What is to be done?—We desire, however, to limit the discussion to the subject of masturbation and its treatment in young girls.

As to the causation of the habit it is a deplorable fact that many of these small children have been taught the habit by older persons and it has been practised in secret until the extreme nervousness of the child has attracted the attention of the parents. Many again learn quite by accident of their anatomical peculiarities and in still others, retained smegma is the cause.

Shall clitoridectomy be recommended as a routine procedure? Those who maintain that after all other methods have failed this operation is advisable must be keenly alive to the fact that the means of gratification of the sense impression is not resident in the clitoris alone but is present in the adjacent structures. In adult women we find that stimulation of the urethra is a favorite mode of sexual gratification and the literature of gynecology has its collection of cystic treasures that defies imagination. The psychical side is also well developed in these selfsame adults; but these factors are usually absent in the child and thus augur certain promise for success in the simple operation of clitoridectomy.

We bring up this question in the hope that our many subscribers will write us about their experiences; in return we would present a digest of these experiences—certainly a very practical problem in pediatrics.

PARATYPHOID INFECTIONS

No clinician who has seen many cases of typhoid-like infections and who has conscientiously and repeatedly tested their blood for the Widal reaction, has failed to encounter a number where this test was persistently negative even during the convalescence and where the clinical picture yet did not admit of any other diagnosis. Since Libman has shown the absolute specific character of the Widal reaction if done properly, a positive result admits of no false diagnosis in doubtful febrile conditions provided previous typhoid can be excluded; but the question, whether inversely all typhoids must yield Widal's, has, in the light of the so-called paratyphoids, long been an open one. For a purely theoretical reason they have been classed as a separate infection, until with the rapid advance of bacteriology a scientific foundation has been created for this. More, it was found that the germs responsible differed in certain respects from the Eberth and the colon bacillus. Different authors soon published reports which showed that we are not dealing with one but with a group of intermediates which are, however, so closely allied that our present technic has hitherto been inadequate to properly define and classify them.

In an extremely interesting article, B. H. Buxton (Jour. of Med. Research, June, 1902), has undertaken the difficult and almost hopeless task of bringing some order into this class; his experiments were conducted with nineteen different cultures obtained from this country and from Germany and included growths of bacilli such as that of Gärtner and the dysentery and hog-cholera germs, which, while they do not strictly belong to the parocolon group, are still closely related to it in that their site by preference is the intestinal canal and the symptoms to a marked degree enteric. No difficulty was experienced in distinguishing the intermediates as a group, from the *Bacillus coli communis* on the one hand and the typhoid on the other; when, however, the intermediates were more closely studied, it was found that the difference in growth on the ordinary media, such as agar, serum, gelatine and bouillon were only those of degree. Potato also proved to be an uncertain medium to deal with; the indol test was unreliable at its best; the French method of growing on scraped-off cultures offered little encouragement in differentiating and even on Hiss' semi-solid media no constant difference between the intermediates themselves could be detected. Experiments on pathogenicity were not attempted as offering not sufficient hopes for success. Better results were obtained with milk, which is not coagulated by any of the intermediates, but some of them were found to produce, after initial acidity, sufficient alkali to render the milk opalescent. The degree of opalescence varied so that two groups could be formed: group I or paracolons giving irregular symptoms, symptoms of meat-poisoning or typhoidal symptoms and including the germ of hog-cholera, where after 20 days there was distinct opalescence; and group II or paratyphoids with solely typhoidal manifestations, where the milk was opaque after the same length of time. A simple method of distinguishing the intermediates from the typhoid germs is the gas-production which goes on with the former with most of the sugars except lactose, while individual differences are found with the different members. By the use of a glucose agar medium containing neutral red very striking effects were obtained, since the colon bacillus changes the color more rapidly to yellow than the intermediate. It is probably the most valuable medium we have at present for determining between group I and II, for with the former there is still a band of red at the surface in 24 hours while with the latter no change is noticed before 48 hours. It is of interest to note that the grouping is the same with the colored media tests as it is with milk. Finally a number of experiments were made on agglutination. By immunizing rabbits to the various organisms by subcutaneous injections of living agar cultures and then testing the blood, members of the paratyphoid group were found to interact freely; quite as readily in fact as various strands of typhoid would be likely to do and it appears that we are here dealing with a distinct species, the members of which are indistinguishable from each other. Conditions are not, however, so simple with the paracolons; thus the bacilli causing epidemics of meat-poisoning do not form a distinct species, but are simply members of the group since there are differences in their agglutination. Those, however, which gave typhoidal symptoms showed mutual reactions and hence it is better to group them among the paratyphoids, although according to their cultural properties they belong to the paracolons.

In conclusion, the following classification is suggested as the result of the author's experience. (1) Paracolons, those which do not cause typhoidal symptoms in man. A group containing numerous different members, but culturally alike. (2) Paratyphoids, those which cause typhoidal symptoms and which may be further subdivided into (a) a distinct species culturally unlike the paracolons; (b) a distinct species culturally resembling the paracolons. This probably represents the first attempt at classification, and it is to be hoped that the difficult subject will receive further attention from competent bacteriologists, so that ultimately paratyphoid fever may be defined and diagnosed as readily as typhoid fever.

ABSTRACTS

Treatment of Feeble Minded Children.—In this paper Dr. Eichholtz (*Brit. Med. Jour.,* Sept. 6, 1902) says for many years past it has been noticed that a considerable proportion of children have not been amenable to the ordinary curriculum and an Act was passed in 1898, as the result of an inquiry conducted by the Educational Department, enabling school authorities to make provision for those children out of the rates, the condition of admission to these special schools so provided being some mental or physical defect. Only unimprovable imbeciles and the lazy dullard or merely backward were excluded. The larger school boards throughout the country have availed themselves of the services of competent medical men to advise them in the organization of these special schools, no child being allowed to enter who has no medical certificate. The school doctor must possess deep sympathy and be familiar with ordinary school methods; he should have, in addition, a certain knowledge of normal and abnormal states of the child's mind together with a certain accessibility of temperament. His business is to determine whether backwardness is due to other causes than feeble mindedness, such as deafness, blindness and negligence in school attendance, being always careful to exclude from the school imbeciles and mere dunces. In order to secure the maximum improvement at the limit of school age, the school authority is empowered to retain these children at the school until 16 years of age. In these children memory, initiative, attention, concentration, and power of imitation are usually dulled and at times nearly absent, and have to be developed. There is an importance in the sub-division between the human faculties and the animal or sub-human, because improvement of a human kind makes for independence and self-support, and sub-human improvement is temporary in nature, and is of no importance as regards character, wage-earning power and independence. Among the mentally feeble excesses and defects of the lower faculties are found which would be assumed as either criminal or immoral if they existed with a normal consciousness. A child in a temper may hit another with his slate, for instance, or drag down his classmate. As this is the result of impulse rather than volition, these children may always be managed by a good teacher who recognizes her own will in the presence of these storms and who can keep them under control. As a semblance of education may ease the road to a life of crime, it is necessary to insist on the constant need of after care, either by watchful committees who take care of the children leaving school, or by means of homes or colonies to which the child may go on leaving school, where all pitfalls of crime, neglect and danger are absent and there will be supervision for proper living and regular suitable employment. In some cases excessive inconsequent chattering may be present or, on the other hand, aphasia, this latter being caused by some muscular deficiency which must be overcome before he can speak. Reading and especially arithmetic take the most time to acquire after admission to one of these special schools; writing, drawing, brush-painting and clay-modeling coming fairly easy.

The Antiseptic Power of "Tachiolo" Fluoride of Silver.—This paper was presented by Dr. G. Perez (*Il Policlinico,* September, 1902) who has come to the conclusion, as a result of severe tests, that this new antiseptic is a very valuable surgical application. Fluoride of silver is toxic only to a very small extent (fact the author proved by administering large doses of the drug to animals, no unpleasant effects resulting, there being also slight risk of causing staining of the skin). A large number of experiments, with solutions of the strength of 1 in 1,000, have generally been employed in the treatment of wounds, suppurating cavities, ulcerations both tubercular and otherwise, cystitis, endometritis, etc., and gauze has sometimes been impregnated with the drug in this same strength. This solution has never caused any disagreeable symptoms when used for urethral and vesical injections, but it is necessary to reduce the strength to 1 in 2,000 if a slight sensation of burning be induced, using a solution of 1 in 100 when a moderately severe caustic effect is required. Dr. Perez considers "Tachiolo," not as superior to all other antiseptics, but as one in which the best qualities of all other antiseptics are united, thus rendering it preferable to the latter for general surgical practice.

Contribution to the Study of Arterial Lesions in Rheumatismal Infection.—Dr. Rabe (*La Presse Medicale,* September 27, 1902) remarks on the lack of knowledge regarding the occurrence of acute arteritis in rheumatic fever. In examing the state of the vessels of a child of five who died during an attack of acute rheumatism, he found myocarditis and endocarditis both present, but directing chief attention to the state of the arteries found the vessels of the pericardium more involved than others, as if rheumatic poison had a predilection for them. The morbid changes affected the internal and middle coats and was most active just beneath the endothelial lining of the vessel. The inner coat was thickened by irrgular prolongations into the lumen of the vessel; these swellings consisting of amorphous substance, plentifully infiltrated with leucocytes and connective-tissue cells, clearly showing that the morbid process would lead to thrombosis and occlusion of the lumen of the artery. The changes affecting the inner coat are even more interesting than those of the middle coat and are more serious than those alluded to, compromising more severely the integrity of the artery. The elastic and muscular fibers, being completely disorganized, give rise to a reticular tissue. The muscular tissue had apparently liquefied and then coagulated giving an albuminous mass as the result, which stained with difficulty only when eosin was applied. Most of this alveola tissue was formed by the normal interstitial tissue of the middle coat, the result having the appearance of the polygonal meshes of lace-work. Thus the inner coat was the seat of proliferating endocarditis, and the middle coat of an acute degeneration owing to the complete disorganization of the muscular and elastic fibers of the latter. The author suggests the term "Parenchymatous mesarteritis," with the production of an alveola condition for the description of the peculiar histological appearance of this infection of the middle coat. He suggests in addition that this acute pathological change, found apparently in acute rheumatism only, is the result of a virulent infection due to the rheumatic poison, such an inflammation of the arterial wall obviously tending to induce thrombosis of the affected vessel. And finally such a lesion of the arterial wall can become quiescent only through cicatrization of the arterial wall, which must hence remain more or less sclerosed. For this reason the author regards the process as leading to general arteriosclerosis and quotes the remarks of Hanot who had, in 1894, observed the radical artery to be degenerated in some young persons who had suffered several attacks of acute rheumatism. Rheumatic fever must, therefore, be looked upon as one of the many causes of arterial degeneration, if the author's views are correct.

Juvenile General Paralysis.—Drs. Marchand and Leuridan (*L'Echo Medical du Nord,* July 27, 1902) describe a case of this disease in a young woman of eighteen years, who was admitted into the asylum at Bailleul, but became progressively weaker in her limbs, and demented, and died at the age of twenty-two. Cases of this disease have lately become more common, though at the present time only 70 cases have been published by the authors, who now add this one to their list. Close observers have lately considered young patients, regarded first as idiots, imbeciles, or primary dements, as subjects of diffuse meningo-encephalitis, this diagnosis being confirmed by the microscopic examination. In the case just mentioned the psychical symptoms differ from those met with in the adult form which, when it is considered that the brain is an organ whose evolution is not completed until an advanced age, is not at all astonishing. The variations in the clinical symptoms are due to dissimilar development of the mobile elements of the brain, not to difference in the lesions. In this case there was no history of syphilis, either hereditary or acquired, but a history of alcoholism in the father, and Courbemale and Mairet have shown that the descendants of alcoholic parents have a tendency to encephalitis. The diagnosis of general paralysis was easy in this case. A diagnosis of epilepsy might have been made and it was known that the patient had been subject to epileptiform attacks, but the other concomitant symptoms, such as difficulty of speech, fibrillary trembling of the muscles, oculo-pupillary troubles, and progressive weakness of all the intellectual faculties, tend to prove the disease to be general paralysis.

Peripheral Neuritis Affecting a Child.—DR. CARRIERE (*Le Nord Medical,* September 15, 1902) presents a patient, a girl of nine years, who had been in good health until three months before being seen. She first manifested a difficulty in walking, apparently without cause, but later on severe attacks of pain occurred, chiefly in the feet, and always worse at night. The toes, and especially the great-toe, were hyper extended—that is to say, the first phalange were extended, while the second and third phalanges were flexed. The lumbricales and interossei were affected, the abductors of the great and little toe being affected on both sides. No other muscles being involved all passive movements could be easily executed in the affected regions, and there were no contractions. As the gait was extremely feeble and unsteady walking was almost impossible. Violent pains, constant but aggravated, at times were complained of, chiefly of a burning nature, over the feet, while the affected muscles gave a marked reaction of degeneration. By exclusion, the author arrived at the opinion that the disease was peripheral neuritis affecting the internal and external plantar nerves and the branches of the anterior tibial which supply the affected muscles. He admits that it is extremely difficult to account for the lesion, but suggests that Klebs-Löffler bacilli, found in the pharynx although there was no history of diphtheria, may have caused neuritis through their toxins.

Brachial Monoplegia Occurring in the Course of Chorea.—DRS. G. RAVIART and P. CAUDRON (*L'Echo Medical du Nord,* October 5, 1902). Hemiplegia is commonly observed at an early stage of chorea and may, indeed, precede all other movements, the loss of power anticipating the choreic instability by some days or a week or two. Paralysis of a single muscle is much more rarely observed and then only in those which are older than the ones commonly met with. In other words, such paralytic symptoms sometimes accompany the chorea of adolescence. In this article the authors tell of a patient, a girl of fourteen, with a very neurotic ancestry, who had suffered from acute rheumatism, which did not give rise to a heart lesion, however. The attack was severe and long. The movements which had been severe in the right arm gradually subsided, some weeks after the onset of the symptoms and marked weakness of the limb succeeded. It was only a short time before the whole possible movement of the limb consisted in a few feeble inflexions and extensions of the fingers on the affected side. The dynamometer gave a negative result on this side and while this state of things lasted the right hand became edematous and of a dull red color, the movements elsewhere continuing extremely active, the hand also being constantly in motion. The paralysis began to disappear after it had lasted in a more or less complete form for about a month; but as the power of voluntary movement returned so also did the choreic movements, these persisting for another month and then gradually disappearing. A complete cure finally resulted.

Typhoid Fever in Children.—Dr. J. P. Crozier Griffith and Dr. Maurice Ostheimer (*Am. Jour. Med. Sciences,* November, 1902) show so much difference of opinion regarding the frequency of the occurrence of typhoid fever in the first two years of life, in the tables published by them, that they are of considerable interest. These tables consist of a collection of cases reported as typhoid fever in which the data are given with sufficient detail to make the case of some statistical value. Notes of some 417 cases of typhoid fever in children under two and a half years were obtained, the diagnosis of typhoid fever in 30 of these being very doubtful, and in 62 doubtful but probable. The 325 remaining cases include some instances of congenital typhoid fever where the child was born alive, though death ensued in the majority. In some of the fatal cases the presence of typhoid bacilli established the correctness of the diagnosis. Owing to the meager details attending the reports of these cases no relative figures can be given regarding the frequency of symptoms. Although, according to the tables given, more cases have died than have recovered, it is certain that this by no means indicates the actual relative mortality of the disease in childhood. This is partly explained by the fact that in 39 cases the result is not stated. It may be assumed that recovery took place in all of these, though there is probably a greater disposition to record the fatal cases as being more unusual. The authors claim that their figures show typhoid fever to be of more frequent occurrence in early life than the common belief or even published reports would indicate.

Congenital Variola.—It is a well established fact, according to M. Jaconnet (*L'Echo Medical du Nord,* December 14, 1902), that a pregnant woman attacked by variola may transmit the disease to the fetus, the infant escaping the contagion in many cases and presenting after birth a remarkable immunity against inoculation. There are others, however, in which the infant is attacked by variola before birth, coming into the world with cicatrices or a well-marked eruption upon it, or the eruption may develop itself a short time after birth. In the case considered in this article the woman, aged twenty-six, had been vaccinated at birth, but never revaccinated. On the third day of her illness she was confined, before the ordinary papular eruption had appeared, the attack being a mild one. The infant was born at full term and was not vaccinated. On the eighth day some redness appeared, which spread to the whole body by the following day. On the thirteenth day the child was admitted to the hospital, and had then a confluent vesicular eruption on the face and a very extensive papular eruption on the body and limbs, and after three days died of a confluent attack of variola, or the twelfth day of the disease, if three days are allowed for the period of invasion, the attack of variola being five days after birth. The infection of the fetus and a part of the incubation period was passed in utero. It is interesting to note in this unusual case that the attack of variola which was beginning in the mother was transmitted to the child with such an intensity that it died from a generalized confluent attack.

Prophylactic Treatment of Diphtheria.—Antitoxic serum as a prophylactic measure in outbreaks of diphtheria is discussed by SEVESTRE (*An. Med.. et. Chir. Infantile*, April, 1902) under this head. He advocates its employment for all other children of a family in which diphtheria has broken out except in cases where isolation has been strict and early, and even then they should be examined bacteriologically and closely watched. As many as 25 per cent. may be found to have diphtheria bacilli in their mucous membranes. In 150 cases out of 502 who had been injected with antitoxic serum for protective purposes, Netter found bacilli. Thirteen of these caught the disease, none of them after the first twenty-four hours or after the twenty-eighth day, and none died, the protection usually lasting for that period from the time of injection. In contrast with this 87 attacks of diphtheria occurred amongst 491 children who were similarly exposed to infection in the same epidemic and not injected, 13 deaths occurring. The same measures are necessary when diphtheria breaks out in a hospital. In Berlin at the Charite, Heubner makes injection compulsory for every child admitted. Amongst patients suffering from scarlet fever or measles especial care is required when outbreaks of diphtheria occur. According to Heubner the ordinary dose for prophylactic purposes is 250 units for a child, 300 to 500 according to Italian physicians, and double these doses for measles. There is slight danger from the after effects of this injection, only one case in 2,500 thus treated resulting at all seriously. On the other hand protective inoculation is unsuitable in the case of adults, because of violent reaction.

Intubation in Diphtheria.—In the Medical Supplement of the Report of the Metropolitan Asylums Board is published the work done at the Park Hospital. Twenty-eight patients in all were operated upon, two who were suffering from measles and influenza respectively being excluded. Among these there were only four deaths or a case mortality of 14.2 per cent. In eight of the cases tracheotomy was subsequently required and all the patients were treated with antitoxin with the exception of one. The age of the patients varied from under a year up to six years. The intubation tube was worn for a varying period, five days being the longest for any one of them. Only one insertion of the tube was required in most instances, five times being the most it was inserted in any one patient. In ten cases bronchopneumonia occurred, or a percentage of 35.7. The O'Dwyer tubes were employed and in three of the fatal cases it was noted upon examination of the larynx after death, that signs of superficial ulceration were observed. It is considered that both would have healed soon if the patients had recovered. Nourishment, wherever necessary, was administered by a nasal tube. Another table in the same report shows the results obtained by tracheotomy in laryngeal diphtheria at all the Board's hospitals. At the Park Hospital there were 27 cases with 10 deaths. If this number includes the eight patients who had been first intubated, as is presumably the case, the total number of patients suffering from laryngeal diphtheria at the Park Hospital which required operative interference became 47, with 12 deaths, or a case mortality of 25.5 per cent. The average mortality for laryngeal diphtheria treated by tracheotomy at all the hospitals collectively amount to 30.9, this, therefore, is below the average, but is not so low as the case mortality obtained by tracheotomy in some of the hospitals considered individually.

The Microscopical Diagnosis of Scarlet Fever.—Under this title Jacques (*Jour. Am. Med. Ass'n,* Dec. 6, 1902) calls attention to the presence of the diplococcus of Class in cases of scarlatina. This is a very pleomorphic organism met with in the throat in scarlatina, originally described by Class of Chicago. The presence or absence of this organism in cultivation on plates made from the throat in suspected cases and examined by means of impression preparations, is claimed by Jacques to be of diagnostic importance. He sums up his four years' study of the Class diplococcus as follows: In a child who has never had scarlet fever, and the clinical symptoms are present, a rapidly growing culture of the Class coccus from such a case determines the presence of scarlet fever, while its absence excludes the disease. The culture has decided the nature of the disease in some cases before the rash was observed, the patient isolated and others protected from the disease. The absence of the Class coccus in other cases where the rash was present but the clinical symptoms obscure. The microscope is of life-saving importance in mixed infections where germs of scarlet fever and diphtheria are both present, as the more prominent symptoms of scarlet fever may obscure those of diphtheria.

The Anesthetic for Children—Constitutio Lymphatica.—This subject is shortly discussed in an editorial article (*Medical News,* March 8, 1902), which points out that in children at least most of the chloroform deaths occur in the subjects with lymphatic diathesis. The records for the past twenty years at the children's clinic at Gratz showed that in every chloroform fatality there was present the lymphatic hyperplasia, which is the principal feature of the status lymphaticus. Does the lymphatic constitution predispose to death under chloroform? is not now the question, according to Ewing, but rather, Does death under chloroform, in children at least, ever occur in the status lymphaticus? From experience and report he believes that in America the conclusions from the Gratz report hold good. However, fatality may come after ether anesthesia as well. Before general anesthesia is used in children careful examination of the signs of the state must be made, the chief danger of anesthetics lying in operation upon parts needing deep anesthesia. It is clear that to use general anesthesia for operations on the tonsils or for adenoids is at least tempting Fate. On the other hand chloroform is in general the most favorable anesthetic for children if careful search has shown no sign of the constitutio lymphatica, according to Jacobi. When fatal chloroform causes death through the heart and the heart of a child has much more force, proportionately to the body weight, and is less susceptible to inhibitory influence than that of the adult. Again, the child's heart is seldom crippled by valvular disease. Children's respiratory apparatus and kidneys are even more susceptible than those of an adult to the evil effects of ether.

Treatment of Scarlet Fever by a Scarlet Fever Streptococcus Serum.—Dr. P. Moser (*Weiner klinische Wochenschrift* October 9, 1902), has isolated streptococci from the blood contained in the heart of patients who died from scarlet fever, using the blood-serum of animals inoculated with these streptococci to control the outbreak of scarlet fever. There is no real evidence that the streptococci obtained from cases of scarlet fever are peculiar to this disease. Although the author grants this he nevertheless thinks that the efficacy of the immunizing process, which is based on the assumption of the activity of these streptococci, is confirmed by experiment and also states that these streptococci are not invariably harmful to animals. Horses have been injected with stronger and stronger doses of a mixture of living streptococci culture which had not passed through the body of any other animal but had been conveyed from bouillon to bouillon. The blood of these horses was drawn after many months and the serum thereof without the addition of carbolic acid was injected hypodermically in scarlet fever patients. The author thinks that both infection and intoxication may be amenable to the action of a specific streptococcic serum. Out of 699 children suffering from scarlatina 84 were treated by serum injection, and the cases then divided into four classes (1) slight, (2) moderate, (3) severe, (4) lethal. In the first observations treatment was begun too late and the quantities of serum used too small, better results being obtained later when these mistakes had been corrected. The single dose of serum varied from 30 to 180 centimeters, the latter being the quantity generally employed by the author. A second injection was frequently administered. All of the first division, including five cases, recovered, which would no doubt have been the case had no serum been used, mild cases of scarlatina invariably recovering. Those in whom the symptoms were moderately severe are contained in the second group, all of whom recovered. In the third case containing those in whom the malady was severe, 28 in all, only one died. The lethal cases, contained in the fourth class, were 34, of whom 15 died. From these cases only one thing is clear; if treatment is to be of any use it must be commenced early in the disease. The mortality increases according to the lateness of the period at which the treatment is commenced. If the serum was injected on the third day the mortality was 14.29 per cent., rising to 50 per cent. when delayed until the ninth day. When an early injection has been made with the proper quantity the result has been a marked improvement, either preventing the development of the rash or causing it to disappear much before the usual time. Previously high temperature fell, nervous disturbance was alleviated and heart weaknesses were favorably influenced also. Apparently, too, throat complications were less marked. Certainly the treatment did not cause nephritis even when used in large doses, though it is impossible to say whether throat and ear complications were less frequent. It is worthy of note that on the failure of supply of the special serum and the employment of normal blood-serum and the antistreptococcic serum of Marmorek, no influence was made upon the course of the disease by the latter. As regards the immunizing power of this serum the author does not make any statement on account of the uncertainty as to the incubation period of the disease and also because of the small number of cases observed. It is something to be able to state that no untoward results whatever were noticed as regards this treatment and as a result of his labor the author recommends the adoption of this method of dealing with scarlet fever.

Surgical Aspects of the Status Lymphaticus.—In a comprehensive article Blake (*Annals of Surgery,* June, 1902), records seven deaths, with clinical and pathological notes of the disease, three of the fatalities occurring during general anesthesia, the others 23 hours afterward. Five of the cases died in one hospital in a little more than one year. Three were negroes in whom the repeated association of the status lymphaticus, with rachitis, is suggestive. The state is a pathological entity. In the following anesthetic cases the chief lesions were hyperplasia of the lymphatic apparatus, most prominent in the spleen, mesentery, axillary, neck or groin, with the thymus markedly hypertrophied. (1) Hemithyroidectomy for exophthalmic goiter was performed on a man, aged twenty-five years, the anesthetic used being nitrous oxide, ether. After 90 minutes heart and breathing quickly stopped. (2) An apparently healthy boy of two and a half years was circumcised and chloroform used. He recovered well, but by the following night developed a rapid and weak pulse (132), dying next noon comatose and from heart failure. (3) This was a woman, aged thirty-two years, upon whom vaginal hysterectomy was performed. She had been under the influence of nitrous oxide, ether 40 minutes when breathing and heartbeat quickly failed and stopped. (4) A man, aged forty-five years, and apparently healthy, was operated upon for badly united fracture of the leg. He died suddenly early in anesthesia (which is not named), and before operation. As most cases have been observed in the first decade these cases are particularly interesting as all but one were adults. The thymus varied in weight from 22 to 135 grammes. According to Bovaird the average weight of the gland in children is 3 grammes, and is usually much smaller than stated. The association of exophthalmic goiter with status lymphaticus is emphasized, and "it may not be too strong an assertion to make that this condition is, in all probability, accountable far more than credited for the sudden operative deaths in Graves' disease." The author thinks that any evidences of status lymphaticus in patients should raise serious doubts as to the propriety of performing thyroidectomy. With reference to the anesthetic, chloroform is responsible for most of the deaths, nearly all occurring in Germany and Austria, where ether is rarely used. Very few deaths have been reported in the United States, the author having found only one in addition to those given, and this was from chloroform. Cardiac and respiratory failure are the premonitory symptoms of death, lymphatic hyperplasia being of chief importance in diagnosis. The tongue, naso-pharynx, fauces, and superficial lymph glands should be examined. The spleen is usually only slightly enlarged. Attacks of laryngismus stridulus or dyspnea should be noted in children, while in adults attacks of syncope would seem to be the only subjective symptom. Rhachitis or enlarged thyroid would be still further proof. Satisfactory percussion of the thymus is impossible. According to Lartigau, microscopical examination of the lymphoid tissues suggested some form of toxemia as the first cause of sudden death, and no lesions were found which in themselves could account for death. With the exception of one case reported by Ewing the author was unable to find another in which the blood examination showed leucocytosis.

Feeding of Infants and Children.—FREDERICK J. MANN (*American Medicine,* February 7, 1903) says that breast feeding, if possible, is to be advocated except when the purity of commercial foods is insured. The percentage method is preferable, though more difficult for the physician, as each case must be studied. A new-born child has a goodly store of iron in its system, particularly in the liver, on which it draws, for there is very little iron in milk, and if weaning is delayed too long there is danger of the child becoming anemic. The ferments which digest farinaceous foods are present from the seventh to the tenth month in quantities large enough to require this sort of food. Dr. Mann advises giving a dry crust of bread, at first once and later twice a day, as soon as the teeth have developed enough to enable the child to chew it. This helps to develop the jaw and also satisfies the hunger of the child. He also deprecates the practice of feeding a child only such food as has been chopped fine, while meat and its preparations should be withheld from infants. Enough fats and carbohydrates are necessary to supply the demand for heat, energy, nervous and muscular work, these fats and carbohydrates causing a decrease in the proteid metabolism and resulting in the normal growth and development of the child.

Formalin in Septicemia.—DRS. C. A. SNODGRASS and OSCAR H. ELBRECHT (*St. Louis Medical Review,* Jan. 31, 1903) have been experimenting with formalin on rabbits. As the results were apparently negative they were non-committal in reference to recommending or condemning the practice of formalin treatment in cases of septicemia.

Tonsillar Hypertrophy.—This article by GOLDSMITH (*Canada Lancet,* February, 1903) gives a review of cases observed by him in which the indications for removal of the tonsils are (1) deafness, associated with overgrowths; (2) enlarged tonsils in debilitated children or adults; (3) frequent attacks of tonsillar or peritonsillar inflammation; (4) the presence of caseous material in the tonsils, causing impaired nutrition, foul breath, and continuous chronic pharyngitis; (5) enlargement sufficient to impair speech, respiration or deglutition; and (6) small submerged tonsils, the structure of which is often one suppurating mass with which subtonsillar disease is associated. In regard to the various methods noticed he is not in favor of the use of the guillotine for any patient over seventeen years of age, or in submerged tonsils except when an attack of inflammation causes them to project. It is then wiser to remove the whole tonsil, an operation not easily accomplished with this instrument, and he, therefore, advocates the use of the cold snare as being both safe and thorough, providing it be not too fine. As there is danger of hemorrhage it is preferable to crush the tonsil rather than cut it. In removing the small hard tonsils of adults and the long flat tonsils where it is extremely difficult to get sufficient of their substance into the guillotine, the Dundas Grant tonsil punch is particularly useful. The hot snare is of no account in the case of hemorrhage and he, therefore, sees no advantage in using it, and has had no experience with it himself. As hemorrhage may delay until one or two weeks after operation, he advises that great care be taken, even in the milder dressings, for some time. It is necessary to avoid all exertion and to guard against any tendency to clear the throat, thereby separating the crust. The eschar which forms should be allowed to come away itself. He holds that operation should be refused in cases of hemophilia and reports cases verifying his belief.

Carbonated Cod Liver Oil.—It has been found by FÜRST (*Centralblatt f. Kinderheilkunde,* No. 11) that children fatten on carbonated cod liver oil in one-third of the time the ordinary oil requires, as it is much more rapidly assimilated. It is now produced in a durable form by impregnation under pressure, thus preventing the escape of the carbonic acid gas on opening the bottle. It is easier to keep, the taste being also improved, while the digestibility and diffusion through the chyle renders it even more desirable.

Scleroderma in Children.—In this article EBSTEIN (*Deutsche medicinische Wochenschrift,* 1903, xxix, No. 2) urges the necessity of early application of the therapeutic lever in affections of this kind. He knows of no means whereby retrogression may be induced after the contractions and callosities are once established. In abortive treatment he places massage in the front rank. In one of two cases described in detail by him the affection suddenly developed in a healthy child after he had slept under a tree in a damp meadow one hot afternoon. That night he became hot and restless, but seemed well the next day, and little red spots resembling flea bites appeared on one hand and arm during isolation. For a year these spots showed no change, when they gradually became bluish, hard and cracked. They are described by the physician who saw them the day of their appearance as slightly raised, round spots like flat pimples, varying in size, some being as large as a quarter. They were not so solid as the wheals of ordinary urticaria, being much redder, but gradually paled.

Ultimate Results of Operations for Tuberculous Coxitis.—This communication in the *Deutsche Zeitschrift f. Chirurgie,* Berlin, lxv, No. 1, is the outcome of statistics collected from the literature, presented in tabular form, of 44 cases observed in Kocher's clinic at Berne. Of these 44 cases Kocher has cured

67.8 per cent., while in a previous series of 40 cases he was able to cure 70 per cent. As a rule the average is about 27.1 per cent. cured in suppurating cases, 48.8 per cent. representing the mortality. In the non-suppurating cases the mortality was 16.5 per cent., with 74.2 cured. According to Kocher's teaching, unless there is a prospect of removing the primary process in the bone or the casual tubercular process, a tubercular abscess should not be opened. As the abscesses usually communicate with the joint, infection of the one means infection of the other. The general health of 28 of his patients who have been followed to date is very good. All but one have a slight limp, do not use crutches, but a cane or high soles is required by half of them. Half have a good movable joint and with the exception of two who complain of fatigue after half an hour's walk, all can walk from two to four hours without fatigue or pain. While three still have pain in the joint and fistula persists in two, in all the working capacity is practically unimpaired. The names of the private patients not being recorded the results could not be traced, but, as the aftercare in such cases is more scrupulous, the results were superior to those above without doubt.

Plastic Operation for Tendon Defects.—HERTLE (*Deutsche Zeitschrift f. Chirurgie,* lxv, No. 1), without drawing, sutures the stumps of the tendon to a perfectly healthy tendon near by; thus leaving an interval between the stumps implanted in the sound tendon that corresponds to the extent of the defect. Three weeks later, after allowing for healing, he slits the tendon to correspond to this space between and including the stumps. The sound tendon is thus left with only half its width at this point, the other half forming the connecting link between the stumps of the second tendon.

"Fourth Disease."—R. W. MARSDEN (*The Lancet,* Aug. 16, 1902) reviews the evidence for and against the existence of this disease. In the first place he points out that although Thomas decided that the exanthem of rubeola resembled that of measles only, most writers, including Dukes himself and Watson Williams, describe a morbilliform type and a scarlatiniform type. If "fourth disease" exists, Ker, and apparently also Sir William Broadbent, who considers that "there are at least three kinds of measles," would place it between measles and rubella. Marsden, on the contrary, would prefer to place it between rubeola and scarlet fever. The crucial point in his opinion for establishing Dr. Dukes's claim is whether "fourth disease" does or does not protect from scarlet fever or rubella or measles. F. Caiger does not find that cases answering to "fourth disease" contract scarlet fever in hospital. Scarlatinal rubeola, scarlatinal rubeola and scarlet fever mixed, and mild scarlet fever are the diagnoses which have been made for the three epidemics on which Dr. Dukes bases his findings for a "fourth disease." Whilst far from denying its existence, Marsden demands more conclusive evidence in its favor before accepting the disease as a separate entity.

Chemical and Physiological Properties of Plasmon.—Dr. Carstairs Douglas read a short paper before the Glasgow Medico Chirurgical Society (*Glasgow Med. Jour.*, Feb., 1903), on the chemical and physiological properties of plasmon, a food formed on a milk basis which had lately been used somewhat extensively. In process of manufacture, thoroughly creamed milk was taken, so as to have a minimum of fat present, and the caseinogen was precipitated by glacial acetic acid, and dried in a stream of carbon dioxide gas. The result was a smooth, light, yellowish-white powder. The writer, from his analysis, found it to contain about 10 parts of water and 90 per cent. of solids—the latter being nearly all proteid (about 80), while most of the remainder was salts. There was both a trace of fat and very little sugar (1 to 2 per cent). It was thus a highly concentrated proteid food. During its administration, Dr. Douglas found that the excretion of urea and phosphoric acid was distinctly increased, the uric acid being unaffected. It also occasioned a moderate digestion-leucocytosis. In concluding, the writer described certain other preparations in which plasmon was incorporated, and said it appeared to him to be a food capable of ready absorption and assimilation, and suited for use in cases of diseases where there was, or had been, marked nitrogenous waste.

Effects of Tight Diapers.—A. C. Cotton (*Arch. of Pediatrics*), thinks that the ordinary diaper of unyielding material, pinned tightly about the plastic pelvis of an infant, in which the ossification of the bones is not yet completed, may be responsible for pronounced deformities. The contracted pelvis, the most frequent cause of dystocia in America, he thinks may be due in a considerable measure to the compression of the American diaper. The practice also of wadding a large amount of inelastic material tightly between the thighs is plainly responsible for deformities of the femora. There is little doubt in the mind of the author that many cases of genu valgum have their beginning in this cause. To obviate these defects Dr. Cotton advocates the use of light diapers and no more material than is absolutely necessary for the absorption of discharges. Absorbent cotton, either loose or in pads, preferably the latter, retained by a T bandage or triangle of some flexible material, such as cheese cloth, secured by safety pins to the shirt, before and behind, has been found to meet all the requirements.

Fetal Endocarditis.—Fetal endocarditis is a condition so constantly referred to, especially in connection with congenital cardiac anomalies and malformations, that it may be supposed that behind these multiple references must lie a number of well-ascertained facts. But this is very far from the truth, says J. W. BALLANTYNE (*Manual of Antenatal Pathology and Hygiene*).

From the neofetal period on to the very end of antenatal life, the formation of the heart may be said to be in abeyance; it is nearly as well formed at the beginning of the second month of pregnancy as it is a day or two before birth. During this long period it grows in size and weight, and is very active in sending the blood round the circulation, but it develops scarcely at all; no great changes are seen in it, for all the great antenatal developmental processes have been completed before the end of the second month. . . Therefore, it is extremely difficult to understand how endocarditis supervening between the second and ninth month can produce malformations which are evidently arrests of formative processes which are anterior to the first of these dates. On the other hand, it must be remembered that a part of the embryology of the heart is left until antenatal life is over, and is accomplished in the first days of postnatal existence. I refer to closure of the interauricular communication, and obliteration of the ductus arteriosus.

Now, let it be supposed that endocarditis attacks the heart at some time between the second month and the full term of antenatal life. The affection of the endocardium, it may be readily admitted, will so injure the vitality of the heart that after the infant is born there may be delay in the normal closure of the foramen ovale and the ductus arteriosus. In this way, it is quite conceivable, may be produced the ordinary form of congenital cardiac anomaly—a patent foramen and a pervious ductus.

Perhaps it may be necessary to admit that the endocarditis shall have specially attacked the margins of the foramen ovale and the walls of the ductus, but the assumption is not at all an improbable one. Sometimes, also, it may be supposed that the inflammatory process will lead to premature closure of the foramen or ductus. But it may be asked, is endocarditis, coming on in fetal life, not instrumental in producing any other of the malformations of the heart met with at birth? It is conceivable that it may interfere with the rate of growth of the various parts of the heart, although its supervention may be too late to interfere with their actual formation. In this way may be produced "congenital stenosis of the pulmonary artery and aorta." It is also conceivable that endocarditis coming on very early in fetal life may interfere with the normal completion of some of the last of the truly formative or embryogenetic parts of the development, and so lead, for instance, to persistence of the interventricular communication or to anomalies in the separation of the great vessels at the base of the heart.

It must not be forgotten that there is another aspect of the relation of fetal endocarditis to cardiac malformations. It must be regarded as probable that inflammation will be more liable to attack a malformed than a well-formed heart. The presence of malformation will predispose to fetal endocarditis. . . . There are, therefore, two more or less opposed theories regarding congenital cardiac anomalies—the teratological and the pathological. According to the one, they are instances of "errors" in formation; according to the other, they are the results of fetal endocarditis. But the degree of opposition between these views has been exaggerated; indeed, the two theories are not incompatible. The structural defects and malformations and the signs of fetal endocarditis may have a common origin, and may exist side by side as evidence of a common cause which has begun to act in the embryonic period of antenatal life, and has not ceased to do so in the fetal period.

It would appear that fetal endocarditis is relatively common if one accepts the evidence afforded by the presence of white or yellow thickenings on the endocardium, of contractions of the openings or cavities of the heart, and of pathological states of the valves. Theoretically, there is no cause to doubt the frequency of fetal endocarditis any more than that of antenatal hepatic cirrhosis; for if it be granted that these diseases are due most often to microbes, toxins, and poisons coming from the mother to the fetus through the placenta, then the two organs first reached by them will be the liver and the heart, and it is reasonable to look for lesions in these viscera. In this way fevers, tubercle, syphilis, alcoholism and other morbid states in the mother, reaching the fetus through the umbilical vein, set up cardiac and hepatic lesions in the latter. It is possible, also, that some cases of fetal endocarditis arise from bacilli and toxic products manufactured by and in the fetal organism itself. . . . Some of the cases, therefore, are really of the nature of transmitted maladies, while others are idiopathic.

Fetal endocarditis stands out prominently among the other maladies of antenatal life, by reason of the fact that it has been diagnosed before birth.

In estimating the value of the antenatal diagnosis of fetal heart murmurs, the possible fallacy of the uterine souffle must not be forgotten. After the birth of the infant, the diagnosis of the state of the heart is made by the ordinary clinical methods. The cyanosis (early or late in appearing), the curious polycythemia or return of the blood to the fetal state as regards the number of the erythrocytes, the dyspnea and palpitation, the hypothermy, the clubbing of the fingers, and the cardiac murmurs (usually systolic), all combine to form a clinical picture which is easily recognizable. It must be borne in mind that these signs and symptoms are mostly due, not to the endocarditis, but to its results or supposed results, the cardiac malformations. Difficulties arise when the attempt is made to diagnose the exact malformation or combination of malformations which are present in any case.

It is a noteworthy fact that congenital cardiac anomalies, and therefore also endocarditis (if we accept the inflammatory origin of some of these anomalies), are often associated with malformations of other parts of the body (references to cases are given).

While little has been done towards the antenatal treatment of congenital cardiac anomalies, it is an interesting fact that apparently they are sometimes recovered from after birth.

Congenital Heart Disease.—THEODORE FISHER in *Reports of the Society for the Study of Disease in Children* vol. ii, 1902, reports a case of "Congenital Aortic Stenosis in a Child Aged Four months" (p. 16), who died of bronchopneumonia. All the segments of the aortic valve were much thickened, and adherent to one another. This was accompanied by slight changes in the mitral valve, marked fibrosis of the muscular pillars, and marked hypertrophy of the left ventricle. The most interesting fact recorded in this case is that, three months before the birth of the child, which was small but healthy, the mother suffered from severe pain in the left knee, evidently rheumatic. For several days she could only get about the house with great difficulty. The conclusion was drawn that fetal endocarditis of rheumatic origin had caused the lesion.

The second case was one of "Congenital Mitral Stenosis in a Child Aged Fifteen Months" (p. 13). The stenosis of the mitral orifice was not more than one-tenth of an inch across. The interest in this rare condition was still further increased by the fact that the stenosis was of a double character. There was a perforated diaphragm, which was attached to the upper part of the auricular surface of the mitral segments, and below the diaphragm the mitral segments and associated chordæ tendinæ were much thickened and contracted. The heart was hypertrophied, and weighed four and one-quarter ounces. Although it is not clear how this membrane could have been produced, it seems probable that endocarditis led to some change in the relative positions of the portions of the segments which develop from the ventricular wall and from the endocardium, and it was the endocardial portion which has persisted as the diaphragm.

Dr. Sansom, who took part in the discussion that followed, emphasized the point that there ought to be a clear distinction drawn between congenital anomaly and congenital disease. Congenital mitral stenosis, as a congenital anomaly, was a myth, but, as the result of congenital disease, quite possible. He believed that intra-uterine endocarditis did exist, but it was rare. On the other hand, it was to be admitted that where congenital anomalies existed in the heart, the heart was more prone to the ordinary changes found in rheumatism, viz., endocarditis.

Another case is recorded by E. CAUTLEY, illustrating an uncommon form of congenital heart disease, namely, "Atresia of the Conus Pulmonalis and Patency of the Septum Ventriculorum without any Malformation of the Pulmonary Valves or Artery." This case gives additional support to the theory that many malformations of the heart are associated with, if not actually due to, congenital syphilis. Here there was ample evidence of this being present, a cause which would operate during the first few weeks of fetal life. For some reason, the conus pulmonalis was not properly formed, and, in consequence of the obstruction to the flow of blood, the septum ventriculorum was not completed. Such a malformation could hardly have been due to a fetal endocarditis, and would almost certainly be due to an error of development, the result, very probably, of the congenital syphilis.

From the symptoms present in this case, the diagnosis of congenital heart disease was comparatively easy, but to determine the exact lesion very difficult. Perhaps the most important sign was a well-marked soft systolic murmur, heard best over the pulmonary area, evidently due to the obstruction of blood through the narrow conus. The reasons against the murmur being caused by the patent septum ventriculorum are referred to, and are connected with the distribution of the murmur and the very smooth edges of the patent septum. Other notable features of the case were the absence of an extreme degree of cyanosis, and the prolongation of life for a year in spite of the great obstruction to the passage of blood to the lungs by way of the pulmonary artery.

It will be noticed above that Dr. Ballantyne, in dealing with fetal endocarditis, refers to the fact that cardiac anomalies are often associated with malformations of other parts of the body. I would therefore draw attention to the report of two such cases in the volume I have been dealing with.

Robert Hutchison records a case showing "Multiple Congenital Abnormalities." The patient, a boy, aged thirteen months, presented the following:—(1) Congenital heart disease; (2) a rudimentary hare-lip; (3) six digits on each hand; (4) shortening of the long bones of the extremities; and (5) defective development of the gums.

Another case is recorded by G. A. Sutherland and Jackson Clarke, their patient, a boy, aged two years, presenting almost the very same abnormalities.

Harcourt Grevis reports a "Case of Aortic Disease" in a boy aged nine years, with a history of rheumatism, and J. Porter Parkinson, the results of a post-mortem examination where "An Organized Intracardiac Thrombus" was found. At the junction of the auricular appendix with the right auricle, there could be seen a rounded mass the size of a walnut, which was attached by a short pedicle to the inferior part of the auricular wall; and close to it was a similar pedunculated mass the size of a pea. In the recent state these masses were hard, and apparently consisted of organized fibrin, except where there was a cavity filled with broken-down blood-clot. The surface of the masses was smooth and shining. Such cases of organized thrombi in the heart appear to be very rare, softer white coagula being much more common.

Another interesting case is by George Carpenter, "A Case of

Malignant Endocarditis," with hemiplegia and embolism of one iliac artery, which developed changes in the fundus oculi—optic papillitis, a simulated choroidal tubercle, subretinal hemorrhages and pigmentary disturbance.—(*Glasgow Medical Journal.*)

The Training of Children to Prevent Nervousness.—An admirable article on "How Not to Be Nervous," by Dr. Hugh T. Patrick, appears in the *Journal of American Medical Association* for February 7. Though it presents no ideas that are strikingly new, it emphasizes the old ones in a most forceful and eloquent way. This article would do good missionary work if it could be distributed among the laity. What Dr. Patrick has to say of the relation of improper training during childhood to the causation of nervousness in later life is especially good. "Two capital errors in the training of children frequently come to my notice; errors that prepare the little unfortunate for later nervousness or fairly drive him into it. They are, first, leading the child into pleasures and duties beyond his years; second, magnifying his importance in the family and society. It is quite as dangerous to give to children the pleasures of adults as to require of them the labors of the mature. That there is a physical basis for all intellectual processes seems sometimes to be forgotten. Successive groups of brain cells and fibers come into existence with the successive years, and before the birth of these tissues certain psychic functions may not naturally exist. To force mature functions from an immature organism is to violate the virginity of Nature—a crime daily committed in the home and in the school, to be expiated in the sick-room, sanitarium or asylum. In the beginning, the fault generally lies in a mixture of vanity and ignorance on the part of parents. They wish their children to excel in attainment and they like to see them indulging in all the pleasures and excitements of our complex social existence. Later, the young person whips himself on to ruin. To instance only one disaster: the annual casualties following graduation from hot-house schools and colleges easily outnumber those of the whole disastrous camp life and battles of our late Spanish war.

"As regards the second error just mentioned, it has seemed to me that if deliberately planned and scrupulously executed, the bringing up of some children could not better promote what I venture to call centripetal development—development centering in self. The child is not only made to be, but is made to know that he is, the focus of all domestic doings, the hub of the family wheel. Every sensation, perception, conception and emotion is an event. The unlucky youngster develops with a distorted view of the relation of things. He sees enormously enlarged images of his tastes, his clothes, his pains, his likes, his aversions and his talents. These proportions do not fit the facts of existence and the unfortunate individual is as sure to be caught in some form of nervousness as is one to go astray in a labyrinth of grotesque mirrors.

I must note one more point on prophylaxis of the neuroses in children, a point already lightly touched, and then we shall leave the little people—much as I should like to linger. In one form or another fear enters into the makeup of nearly every sort of nervousness. It paralyzes judgment, ambition and the higher emotions. Childhood should be absolutely fearless; fearless for self and for the future. That the young should have no fear of man or God, no thought for the morrow, is natural and proper. It is natural and wholesome that the child should have no regard for his organs, no knowledge of hygienic rules, no conception of the significance of pain. When the parent makes the child a party to his apprehensions, confides his prescience of ills and communicates the ominous augury of bodily symptoms, he is assiduously rearing a little hypochondriac who will live to condemn the parent who made him a burden to himself and a curse to others. Fear of the dark, of thunder and lightning, of animals, burglars, accidents, spirits, devils and death is born of parental foolishness, and is always potentially the seed of later nervousness. Quite recently a physician, who for many years has had at intervals typical and intense agoraphobia with fear of sudden death, told me with the utmost naïveté that when a child he never could sleep alone. It seems never to have occurred to him that if he could not sleep alone it was because he was allowed to have such a fear, or, quite as likely, because the parents carelessly or deliberately planted fear in his infant mind."

Cerebral Diplegia With a History of Asphyxia Neonatorum.—R. Barclay Ness reported the case of a boy, aged two years and ten months. The mother, who is quite an intelligent woman, states that she has had in all seven children, and that this is the only child in which there is anything "unnatural." She states that this child, like the others, was born at full time. When labor commenced she sent for the doctor, and on his arrival he administered what she called "labor tea." In about ten minutes the labor pains she says, were "fearful," and in about two hours the child was born. The first remark thereafter that she heard, was to the effect that the child was dead, and she was asked whether or not she had felt any movement that day, to which she at once replied, "Yes." The child was livid—"like the grate," as the woman in attendance said—and it was considered dead. This, however, was recognized not to be really the case, as the child, some little time after, was seen to give a gasp. The condition had really been one of "asphyxia neonatorum." The doctor, after continuing artificial respiration and other means at his disposal with great perseverance for about two hours, succeeded in resuscitating the child, but the condition only passed off gradually. Next morning the color of the child was natural, but the friends at the time were surprised that the child did not cry. The condition was neither accompanied nor followed by convulsions. During the first six months of infancy the mother considered everything in regard to the development of the child natural, but at about this period she noticed the peculiar movements of the hands when he attempted to grasp anything. Then she realized what had always been a fact, —that the child could not sit properly upon her knee. He required always to be supported by her arm on his back; this is the case up to the present time. Another fact that has attracted her attention is that the child, when much handled, as in putting on his clothes or when in his bath, becomes quite rigid, the rigidity being the result of tonic contraction of the muscles of the trunk and limbs from reflex stimulus. Another fact noticed by herself is that the child's most comfortable position when on her knee is to have the legs crossed. On examining the child, there is rigidity affecting both arms and legs. In the legs this is best appreciated by abducting them. The spasm of the adductor muscles is usually well marked, and it is this which so commonly leads to crossing of the legs. Associated with this spastic rigidity is the difficulty in movement. Both of these facts are very apparent when the child is induced to make any attempt to walk. The cross-legged mode of progression is not, however, so evident here as in many other cases, where the spasm of the adductor muscles is much greater and the child older. The spastic paralysis described is associated with increased reflexes, most easily shown in the case of the knee-jerks. Ankle clonus is not so readily elicited on account of the muscular spasm. A similar spastic condition exists in both arms, and is associated with awkward movements whenever any attempt is made by the child to catch hold of anything. It is like "athetosis," though not in its most typical form. Over and above these facts there is a strabismus and a drawing of the face to the right side when the child cries. These are facts, however, that the mother has only observed lately. The facial condition is associated with a greater degree of paresis in the left arm and leg than is evident in the right side. Although the child can hear and see, his intelligence is not by any means equal to that of a child of about three years old. The mother, however, thinks his intelligence is good, that he notices people quickly, and is attracted by what they do. He, however, cannot speak beyond saying a few monosyllables. He has not yet been taught to be cleanly in his habits. There is nothing to state with regard to any abnormalities or diseased condition of other organs.

As regards the actual cause of the paralysis, he did not think there could be any doubt that it was the result of the "asphyxia neonatorum," which induced meningeal hemorrhage. The credit of suggesting this as a cause of the condition belongs to Little, who made a communication on the subject to the Obstetrical Society of London in the year 1861. Little's position was afterwards proved to be correct by the post-mortem examinations of M'Nutt, who found that when hemorrhage did occur it was usually basal in cases of head presentation, while extravasation over the cerebral hemispheres occurred more commonly in cases of foot presentation. It is probable, however, as Gowers remarks, that the cortical hemorrhage also occurs in cases in which the head is born first. Such hemorrhages, then, do occur in difficult cases of parturition, and may produce the condition now variously described as Little's paralysis, cerebral birth paralysis, apoplexia neonatorum, cerebral diplegia, etc., but a condition quite similar in its clinical features may occur where parturition has been perfectly normal, where no difficulty was experienced and where the child showed no signs of asphyxia. Little recognized this himself, because a great number of his recorded cases are simply those of premature labor. He did not, however, suggest the real cause in these cases. Pierre Marie has suggested the non-development or the arrest of development of the crossed pyramidal tracts as a cause of this form of spastic paralysis. In the human embryo 12 centimetres (4¾ inches) in length, the pyramidal tract appears to be completely absent, although the other tracts of the cord can be distinctly perceived. They are in all probability formed towards the middle or end of the fifth month of fetal life, but not complete until four months later. Premature birth may therefore have some possible connection with the arrest of development of the connecting pathway between the cortical centers of the brain and those of the spinal cord.

Possibly Collier and Russell are right in their suggestion that there is a common cause bringing about premature labor and arrest in the development of this particular part of the central nervous system of the fetus. Such agencies, I think, could easily be found in alcoholism, syphilis, tuberculosis, etc., but it is quite possible that such agencies might act in preventing the full development of the central nervous system and yet not act in producing premature birth.

Hence, there are cases of cerebral diplegia, with a history of "asphyxia neonatorum," others with a history of premature birth, and yet, again, others with no such history. This aspect of the question the author presented to the Pathological and Clinical Society last year, when he showed three cases of cerebral diplegia, one where birth was premature by two months, and other two—who were sisters, an important fact—where there was no history of anything unnatural at the time of birth, but where there was, however, a neurotic family history, and a history of alcoholism on the part of the father. These two factors might very well be taken into account in determining the actual cause of the condition in these latter cases, though not potent enough to produce premature birth.

This is the way in which he had been accustomed to look at these cases of cerebral diplegia with histories so different, but the cases which will be of most interest to the obstetrician are those where the condition is produced in presumably perfectly healthy children during parturition, and which in the hands of skilled obstetricians might sometimes be prevented.—(*Glasgow Medical Journal,* Feb. 1903.)

Deep Depression of Frontal Bone in New-Born Relieved by Operation.—Robert Jardine (*Glasgow Medical Journal*), reported this case. The mother of the child was a small, rickety woman. She said that she did not walk until she was seven years of age. Her legs were not markedly deformed. The pelvic diameters were as follows:—Intercristal, 10¼ inches; interspinous, 9¾ inches; diagonal conjugate, 4 inches. The true conjugate would thus be about 3¼ inches. Her first child had been delivered by forceps. In this, her second confinement, the head had presented well-flexed, with the occiput towards the front and left. The head was partly moulded into, but had not passed the brim. Chloroform was administered, Milne Murray's axis-traction forceps applied. Considerable traction force was needed, and, as the head passed the promontory, there was a thud. The child soon cried, and seemed to suffer no inconvenience from the very marked depression of the left frontal bone. Firm pressure was applied to the head, but failed to raise the depression. As the patient lived in a single room, and the surroundings were anything but sanitary, the child was left until the mother could accompany it to the hospital. The mother made a normal recovery, and she and the child were admitted to the Maternity Hospital on 23d August. The child was quite well, but the depression in the bone had not risen. After photographs and a cast of half of the head had been made, the author reflected about an inch of the scalp from the back portion of the frontal bone, and made a small incision through the bone, about a quarter of an inch in front of the suture, then passed Macewen's periosteum elevator between the dura mater and the bone, and raised the depression. The incision was made away from the suture, because the dura mater is always adherent at the suture and he wished to avoid cutting the dura. The bone was fairly hard, but he cut through it with a sharp-pointed bistoury. When he passed the elevator in, there was a gush of blood-stained serum. He was surprised at the amount of force required to raise the depressed bone. The wound in the scalp was closed with stitches. The child stood the operation well, but took nearly as much chloroform as an adult. The scalp wound healed by first intention, and the child kept perfectly well.

It is surprising that so marked a depression caused no inconvenience, but if it had been left, the brain functions would sooner or later have become affected, and the child have developed into an idiot or an epileptic. The most marked depression he had seen was in a case where there was no deformity of the pelvis. The abdomen was exceedingly pendulous, and delivery was effected with high forceps. The child seemed perfectly well. The depression had lessened considerably by the time of dismissal. As to the final result no report was made.

Mistaken Sex.—Robert Jardine (*Glasgow Medical Journal,* Feb., 1903), said that in hypospadias the genital organs of the male closely resemble those of the female, and if a careful examination is not made a mistake may easily arise, and a male may be actually registered as a female child. A case of this kind has recently come under his observation. The child, a supposed female, when a fortnight old, was brought to him by the midwife who had attended at the birth, as it was tongue-tied. The midwife asked him to look at the genital organs, as they were larger than usual. He found that what the midwife and the mother had taken for somewhat enlarged female genital organs, were really a divided scrotum with a testicle in each side. What they had taken for the vagina was merely a shallow depression. The penis resembled a somewhat broadened and enlarged clitoris. As the child had already been registered as a female, it was necessary to apply to the sheriff for a warrant to have the entry changed. In such cases it is rather awkward when the discovery of the true sex is not made until the age of puberty is reached. In this case it was fortunately made early. The midwife was a very competent woman, and had attended thousands of cases, both in connection with hospital and private work, and yet she was misled by the strong resemblance the organs had to those of a female. In such cases it is of the utmost importance to definitely settle the question of sex, so a very careful examination should be made.

Treatment of Fractured Thigh in a Child.—H. D. Senior (*Medical Council*) treats fracture of the thigh in children too young for mechanical restraint by vertical extension without splints, as shown in the accompanying illustration. A rigid gallows is made of iron or wood, provided with pulleys to carry a cord, one end of which is attached to a weight just sufficient to keep the buttock of the afflicted side off the mattress. The cord is attached to a "spreader" held to the limb by adhesive plaster. Four weeks of extension is generally sufficient for firm union, but if preferred a starched bandage may be applied over flannel for a few weeks longer. In the case of very young children the gallows may be attached to a board, so that it can be easily held, to nurse, etc.

In older children Dr. Senior prefers Hamilton's splint. This consists of two splints about four inches wide extending along each side of the body from arm-pit to four inches below the sole, connected across the front of the body. The splints are made of wood 3-8 inch in thickness (more or less, according to weight of patient) cut off square at the upper end and with two narrow V-shaped notches cut in the lower end in such a way as to leave three projections, around which a few turns of bandage can be taken in securing the ankle to the splint. The splints are connected by two U-shaped pieces of "hoop" iron about 1-8 inch thick and 3-4 inch wide, one crossing a little below the nipple and the other a few inches below the pubes. The splint must be well padded so as to fit comfortably to the body. A spreader and plaster is applied to the affected limb, which is loosely bandaged to its splint. The other limb and the child's trunk are then bandaged to the splint.

Hip Joints at Home and Abroad.—The *Medical News* in a recent editorial says: Some fifty years ago, when Sayre had done more than forty cases of excision of the head of the femur, he said that although there seemed a bright outlook for the operation, its period of usefulness would be short. His prophetic eye saw into the future with a clearness that was characteristic of the man. Whereas thirty years ago excision of the hip was a common operation in this city, relatively speaking, today it is equally rare.

Even in staid surgery fashions come and fashions go. In 1846, just about the time that Sayre was beginning his series, Pancoast wrote, "Notwithstanding the common fatality attending the ordinary treatment of coxalgia *with caries of the head of the bone,* there seems as yet little or no reason to believe that the chances of the patient would be improved by resorting to so severe an operation . . . the patients in the greater number of cases dying in consequence of the extension of the caries, the violence of the consecutive inflammation, or of the exhaustion produced from excessive suppuration." History repeats itself. In 1903 we read, Bradford and Lovett, "The risk from death arising from general tuberculosis and tuberculous meningitis in cases of hip diseases treated conservatively, is very small: about six per cent. After operation, on the other hand, in addition to the small mortality from the direct shock of this operation there arises a death rate, according to some authors, of almost fifty per cent. from secondary tuberculous involvement. The hope of immunity from tuberculous infection has not been gained by resection."

Apparently we have passed the milestone; we are now sufficiently advanced, in this country, to recognize coxitis in its early stages, to give it suitable protection that time may work the cure; Sayre's prophecy has been fulfilled.

So much for ourselves and our attitude toward this disease. How about the rest of the world? It is then with a feeling more akin to pity than anger that we scan the pages of a voluminous article in a recent number of the *Zeitschrift für Chirurgie,* and struggle through histories of forty-four resections! The author evidently feels that he has entered an untrodden field, and the general trend of the article is cut! cut!! cut!!! Cut the child from the hip, as though the disease were malignant; dynamite out the acetabulum, if need be; hoe out the shaft of the femur and epiphysis if necessary—it's a sort of *"ad majorem Dei gloriam"* job to be relished by all. This odd man admits a mortality in pus-free cases of 16.5 per cent. and 48.8 per cent. in that vast majority where it is present. How anyone not the victim of fixed delusions can urge these monstrous figures on the public passes wonder! Here, however, is the explanation—read his wretched bibliography—out of a total of fifty authors cited from only ONE writes in English, and he is well known to be a rabid advocate of excision. It may be well for the German surgeon to pause before he further decimates and maims the young generation, to read what we can tell him. Despite the greatness of the empire these children *might* be useful.

A Case of Achondroplasia.—CHARLES HERMANN (*Arch. of Pediatrics*) reports a case of achondroplasia or micromelia. The patient is a boy of fifteen, of Russian parentage. The rest of the family are in good health and physically and mentally normal. The birth was easy and nothing abnormal was noted until he was ten months of age, when it was observed that his head was large and his extremities short. He could not sit up until he was five, nor walk alone until he was seven. He began to talk distinctly at seven. Examination showed his height to be 3 feet and 11 inches, and his weight 60 pounds. Comparing his movements with those of the average boy at various ages, his height is equal to that of a boy of seven; his trunk is equal to that of a boy of thirteen; his head equal to that of fourteen, and his extremities equal to those of a boy of five years. His genitals are well developed and pubic hair abundant. His intelligence is retarded. The most striking thing about his appearance is the large, well-developed chest and the small, dwarf-like limbs. The cause of this condition is obscure. The trouble seems to lie in the cartilaginous zone between the epiphysis and diaphysis of the long bones.

Early Treatment of Quinsy.—J. P. WEST (*Cleve. Med. Jour.*) says that the advice given in some text-books as to the operative treatment of peritonsillar abscess is wrong, especially in two particulars. The first is to make the incision through the tonsil. It is rare indeed that the abscess is in, or discharges through, the tonsil. The second is to make the incision where the abscess can be seen pointing. This prolongs the suffering and almost always the abscess will open before it can be seen to be pointing. The location at which it most frequently points is above and to the inner side of the tonsil, but the place an incision should be made is where fluctuation is felt, and the time to make it is as soon as fluctuation can be felt. It takes considerable patience and some practice to locate this point early. Opening the mouth is painful, but a few trials will give sufficient room for the physician to work his finger far enough back to make a careful exploration. Fortunately these patients are usually adults and are willing to undergo a good deal for the promise of relief. This examination should be made as soon as the disease is suspected and repeated at each visit until the thing sought is found. Early in the disease all the tissues in, above and around the tonsils are hard and dense, but ere long somewhere in this dense tissue will be felt a softer spot that shows where nature is making an effort to discharge the pus, and there we can aid nature to the great relief of the patient. This spot should be carefully located with the finger so that it can be fixed later with the eye. Under a reflected light, the tongue held down with a depressor, a vertical incision should be made. Very rarely will this procedure fail to discharge the pus and put an end to the trouble.

Infantile Obstetrical Paralysis of the Shoulder.—R. H. Parry reports three cases of the above which had been under his care in the Royal Hospital for Sick Children within the past two months. The first case, a boy, one year old, was a good example of injury to the fifth root of the brachial plexus; the muscles affected being the deltoid, biceps, brachialis anticus, supinator longus, and spinati. On examination, the left arm was seen to hang fully extended by the side, the palm of the hand was directed outwards and the thumb backwards, this position of the hand being maintained by the pronators. The child could not raise his arm from the side, nor flex the fore-arm, nor supinate the hand. He retained, however, the power to adduct and to extend the arm; the former movement by the action of the costal part of the pectoralis major, and the latter by the triceps. The grasp of the hand was good, and there was no wrist-drop. There was much atrophy of the deltoid, biceps, and spinati muscles, in consequence of which the bony eminences about the shoulder appeared unduly prominent.

The second case, a girl, two years of age, was also an example of injury to the fifth cervical nerve. Accordingly, it presented the same features in respect of the muscles affected, but on the right side. It was added, however, that extension movement at the elbow and the grasp of the hand were more feeble than in the case of the first patient, and the question arose whether the sixth and seventh roots may not have been involved. The triceps and flexors of the hand are supplied from the sixth and seventh roots. The right side of the face appeared somewhat smaller than the left, and there was, perhaps, a slight ptosis of the right eyelid, but no squint. There was in this case a torticollis, and some thickening immediately above the clavicle, due no doubt to laceration of the sterno-mastoid and of the scaleni muscles at birth.

In the third case, a boy, aged six months, the fifth, sixth, seventh, and eighth cervical nerves appeared to be implicated, inasmuch as all the muscles of the limb, with the exception of the costal portion of pectoralis major and some of the intrinsic muscles of the hand, were paralyzed.

The left arm was soft and flabby, and hung limp by the side. The hand did not assume a definite position as in the other two cases, owing to the fact that the pronators, as well as the supinators, were paralyzed. The natural contour of the shoulder was much changed, due to wasting of the muscles, especially the deltoid. No response was obtained in any of the muscles to the faradic current. There is a subluxation forward of the head of the humerus, brought about by the unopposed action of the pectoralis major. The fact that the nerve supply of this muscle remained intact led to careful observation of some of the other muscles supplied by the eighth cervical and first dorsal nerves, with the result that it had been definitely ascertained that slight flexion of the fingers took place.

In all three cases there was a history of difficulty at birth. In the first two the breech presented, and during the descent of the body an arm slipped over the head, and in one became hooked over the occiput. In the third case, a cranial presentation, the forceps were used to terminate a long and tedious labor, and resuscitation was effected with some difficulty, artificial respiration being continued for one or two hours.

With reference to the manner in which the injury may be brought about, the investigations of Schoemaker on the cadaver are of much interest and importance.

In a paper which appeared in the *American Gynecological and Obstetrical Journal* (January, 1901), Thomas gives the following summary of Schoemaker's experiments:—"If the child's neck were stretched in the direction of the axis of the body, the upper roots of the brachial plexus were put upon tension, not materially increased by bending the head forward or backward, or rotating it, but very much increased if the head were bent laterally, the fifth root being most stretched, the sixth next, and the seventh and eighth much less. The fifth and sixth roots of the brachial plexus were constricted when the shoulders were compressed and pressed upwards, and especially when the arms were elevated above the head. The constriction occurred between the clavicle and the transverse process of the sixth cervical vertebra, being so great as to make an indentation on the nerve roots. If the forceps were applied at an angle of about 30 degrees, Erb's point was compressed. In labor, in head presentations, the first danger is from pressure by the clavicles; but this is slight unless the shoulders are compressed and presssed toward the head. After the head is born, and hanging over the perineum, with the woman on her back, the plexus may be injured by stretching; and if traction is made with the head bent toward one shoulder, there is great danger of overstretching the plexus. Where the obstetrician's fingers are placed in the axilla, and strong traction made to deliver, the clavicle may be raised and the plexus be compressed against the spinal column.

In forceps cases, the danger from over-stretching is greater than that of direct injury to the nerves from the instrument.

In breech cases, constriction and pressure of the shoulder are especially liable to occur.

Prognosis.—These cases do not furnish a basis for a favorable prognosis, and judging from the few cases recorded of complete recovery, it is to be feared that the paralysis becomes permanent or improvement only partial.

Treatment.—Massage and gentle exercises had been tried in all from shortly after birth, and although the result has so far been far from encouraging, still it is advisable to persevere with this line of treatment.

Electrical treatment, advocated by most writers on obstetrical paralysis, is not easy of application in very young subjects, and, as pointed out by Dr. Love, it would be found necessary, in order to carry it out effectually, to administer an anesthetic.

In only one (the second case) was the question of surgical interference raised. The child, a patient of Dr. A. W. Russell, was seen by Drs. Finlayson and Love, who suggested that something might be done in the way of nerve anastomosis, or by attaching portions of a healthy muscle to a paralyzed one, to improve the movement at the shoulder. As already mentioned, there was evidence that the sterno-mastoid and the scaleni muscles had been damaged, and as the roots of the plexus pass between the scalenus anticus and medius, and the injury was limited mainly to the fifth root, it was thought proper to explore the plexus before acting on the suggestion made by Drs. Finlayson and Love.

Operation.—An incision was made over the sterno-mastoid, and the latter divided transversely near its lower attachments. The scalenus anticus was then defined, and the various structures in relation to that muscle carefully noted, the phrenic nerve calling for special consideration.

The fifth, sixth, and seventh nerves, and the trunk of the eighth and the first dorsal, were next looked for at the outer margin of the scalenus anticus, and each was carefully examined.

On seizing the first with a dissecting forceps, no contraction of the muscles supplied by it took place, but on applying pressure to the other roots, the response in the muscles of the fore-arm and hand, and in the pectoralis major, was very prompt and marked.

It was found impossible to determine accurately, from the contractions induced in the muscles, the distribution of each root.

On tracing the nerves towards the spine, no difficulty was experienced in freeing the seventh; the sixth, however, was more intimately attached, while the fifth was firmly adherent to the scalenus anticus, and it was found necessary to remove the upper part of the muscle to avoid damaging it. A small neuroma was present near where it joins the sixth, and the sheath of the nerve was no longer recognizable as such. Comparatively few opportunities have been afforded of determining the state of the nerves in obstetrical paralysis, and the facts just detailed in connection with the fifth nerve may serve to explain the tardiness of recovery. No attempt was made to remove the neuroma owing to its proximity to the sixth nerve.

The other points in the operation do not call for special remark, but it may be added that the wound healed without trouble.

Although no marked improvement has followed the operation, which was performed three months ago, still the parents affirm that the child makes a greater effort to use the arm.—(*Glasgow Med. Jour.*, February, 1903.)

Tuberculous Peritonitis in Children.—M. Comby (*Archives de Médecine des Enfants,* Jan., 1903) studies the medical treatment of this affection and shows that it can be cured without surgical intervention. In the first place absolute rest in bed is indispensable. The child should remain in this position for several weeks—several months if necessary. This horizontal position will favor the reabsorption of exudates, keep the parts from injury and spare the dependent organs. Rest must not exclude air and sun. The windows of the patient's room should always be open, and if possible, the room should open to the south. During pleasant weather the air cure can be taken out of doors, on a portable bed or a special carriage. Whenever possible, he should be sent to the seashore or country. At the same time the patient should be fed as liberally as his appetite will permit. One may give milk, eggs, vegetable purées, meat, raw meat or meat juice. Medicinally one may employ according to indications and tolerance, cod liver oil, pure or with creosote, glycerophosphate of lime, lecithin, local application of creosoted oil, iodin to the abdomen, collodion, compresses to the stomach, frictions of black soap, etc. But all this is but accessory. The principal thing is to place the child in the best hygienic condition—one which will not prevent the natural regression of the tuberculous products, their fibrous transformation and reabsorption.

Prognosis of Tuberculous Peritonitis in Children.—G. A. Sutherland (*Arch. of Pediatrics*) bases a study of the prognosis of this disease upon an experience with 41 cases treated in the Paddington Green Children's Hospital. Among these cases 29, or 70.7 per cent. recovered; one was unrelieved, and 11, or 26.8 per cent., died. Of those treated medically (27 cases), 22 recovered; of those treated surgically (14), 7 recovered. The author admits the possibility of recurrence in some of the cases reported as recovered. His conclusions concerning the factors involved in the prognosis are as follows:

1. In uncomplicated tuberculous peritonitis the prognosis is good. 2. When tuberculous pleurisy is present, the prognosis is still favorable. 3. The prognosis is rendered less favorable in the case of (a) a strong family history of tuberculosis; (b) an infancy passed under bad hygienic and dietetic conditions; (c) a constitution of feeble resistant power, or (d) a history of severe infective illness in early life. 4. The prognosis is rendered less favorable in the presence of one or more of the following symp-

toms: Continuous pyrexia, rapid wasting, persistent diarrhea, rapid pulse, or recurrent acute exacerbations. 5. The prognosis is rendered less favorable in the presence of one or more of the following local complications: (a) tuberculous ulceration of the bowel; (b) extensive caseation of the mesenteric lymph nodes, or of tuberculous masses; (c) localized suppuration from infection through lymph nodes, or the intestine; (d) obstructive symptoms from bands or matting of the intestine. 6. The prognosis is bad in the case of the following complications: (a) the rupture of a suppurating lymph node, or the perforation of an intestinal ulcer into the peritoneal cavity; (b) pulmonary tuberculosis; (c) tuberculous meningitis; (d) general miliary tuberculosis. 7. In tuberculous peritonitis the prognosis is not appreciably affected by simple laparotomy.

The Medical Inspection of Schools.—When those who are responsible for the education of the young, and especially those to whom is entrusted the conduct of that "elementary" education which is now compulsory upon all, once become thoroughly awake to the serious nature of the charge which they have undertaken, we may expect the medical problems involved to receive much more attention than has so far been accorded to them. The duties of the public in regard to children compulsorily removed from the care of their parents extend far beyond the provision of educational facilities. So far as school hours are concerned the public authority stands *in loco parentis,* and under such circumstances it is obvious that questions of health become matters of first importance.

At the present moment a certain degree of awakening of the public conscience in regard to this matter is taking place; here and there school authorities are appointing medical officers who, in addition to giving general advice on health questions, are supposed to undertake some sort of medical inspection of the schools if not of the scholars, and the very fact that such a beginning is being made renders it desirable before new ways get fixed and crystallized and new vested interests become interwoven in the system, to urge that the whole matter of the medical inspection of schools and scholars touches so intently upon matters of public health, that instead of the school managers engaging their own inspectors and instead of these inspectors having regard merely to what is good and advisable from an educational point of view, the medical inspectors of schools ought to be appointed by the sanitary authorities, and ought in their inspections to have regard to what is best for the good of the community. The time is peculiarly appropriate for the discussion of this matter, since under the new Federation Act a definite link is provided between the sanitary and educational departments of the local authorities of the country.

In comparison with the very feeble efforts made to discover the beginnings of illness in schools even by the most progressive school managers in this country let us consider what is regarded in New York or Boston as an essential step for the prevention, or at least for the diminution of the dangers inseparable from school life. In New York City 250 medical inspectors are daily engaged in the work. This medical inspection is done under the Sanitary Bureau of the Department of Health, and is made to apply not only to the public schools but also to parochial and other schools managed by various bodies and societies. In Boston there are fifty inspectors who are authorized agents of the Board of Health. In addition to visiting the public schools daily to examine all sick pupils and to advise the teachers in regard to them, they also decide such questions as may arise as to the propriety of excluding from the school other children living in the same building, and visit every reported case of diptheria, membranous croup, and scarlet fever to ascertain the effectiveness of the isolation.

Th system appears to be much the same wherever it is put in practice. The inspection is made in the early school hours, generally between 9 and 10 a. m., the teachers referring to the examiner all such pupils as present any symptoms of illness. The examiner occupies a separate room in which he investigates the cases one by one, makes his diagnosis, and decides what steps are to be taken. In all cases of infectious disease not only is the child at once sent home but immediate notification of the case is given to the sanitary office. Moreover, in these infectious cases the physician examines all the members of the same class or those who have been sitting near the affected pupil, taking cultures from the throat if necessary, so as to pick out any who may have become infected at the earliest possible moment.

That the medical inspection of schools so carried out is likely to prove of the greatest possible service to the community we can have no doubt, while it seems equally clear that it is only just to those children who are compelled by law to expose themselves to the risks of school life, that everything that is possible should be done to reduce those risks to the smallest possible dimensions. The point however on which we would just now more particularly insist is that all this medical inspection is a matter of public health rather than of education, and that it should be definitely handed over to the public health authorities.—(*The Hospital,* Feb. 14, 1903).

Why Parasitic Worms are not Digested.—Many reasons have been given in the past to explain why the gastric and pancreatic juices do not attack the walls of the digestive tube. We have also been equally in the dark as to how it is that the parasitic worms can live in both the stomach and the small intestines in the presence of strong proteid-dissolving ferments. WEINLAND (*Bioch. Centralbl.,* January 15, 1903) has found that the fluid pressed out of round worms from the gut of the pig has the power of preventing the gastric and the pancreatic juice of the same animal from dissolving fibrin. He was able to separate some of the active substance by means of precipitation with alcohol. A similar body was also obtained from the mucous membrane of the stomach and intestine. He therefore regards the resistance to proteolytic ferments which is shown by the gastric and intestinal lining and by parasitic worms as due to an antiferment which opposes itself to the tryptic (or peptic) ferment. The antiferment is destroyed by boiling.—(B. M. J.)

Failure of Formaldehyde in Septicemia.—Experiments in New York go to show that formalin is only a temporary check to the growth of germs and in the long run proves an injury to the patient. Rabbits infected with blood poison germs and subjected to formalin treatment died several hours sooner than rabbits similarly infected and not placed under the treatment. DR. PARK and DR. A. W. PAYNE (*Med. News.,* Feb.) both bacteriologists of the health department, began experiments soon after the first cure of blood poisoning by Dr. Barrows was announced. Two dozen rabbits were inoculated at the same time with the germs of blood poison—the streptococcus germ. An hour later, a dozen of the rabbits were subjected to an injection of formalin. In every case save one the dozen rabbits on which formalin had been used died from 12 to 24 hours before the others. The rabbits on which the formalin treatment was tried showed symptoms of temporary relief. It was declared that the results of the experiments show that while formalin coagulated the bacteria and stopped the growth for a time, it injured the blood and seriously impaired the cells.

Adenoids and Trachoma.—At a recent meeting of the New York Academy of Medicine DR. RALPH OPDYKE (*New York Med. Rec.,* Jan. 3) read a paper in which he drew attention to the marked relationship existing between trachoma and adenoids, a subject which had been forcibly brought to his notice as the result of examinations made on the children of the city at the request of the Commissioner of Health. The children were examined with regard especially to catarrhal and contagious diseases of the eyes. In the course of these examinations of many thousands of children adenoid vegetations of the superior and posterior nasopharyngeal space were so frequently met with in cases affected with severe trachoma that he was forced to take into serious consideration the relationship of these two diseases. Especially was this the case in the so-called "operative" forms of the disease where on an average two out of every three cases had pronounced adenoid vegetations with all the typically marked symptoms of this affection. The same condition was found to be present not only in the lower East Side schools, but also in the uptown West Side schools, notwithstanding their better facilities and healthier children. The same connection has also been observed among the trachoma cases assigned to Dr. Opdyke for treatment at the various hospitals with which he is connected. To prove that the abnormally large adenoid vegetation in the pharynx is an antecedent to the trachoma complication of the lid, we need but recall that the adenoid vegetation is present at birth, while the lymphoid structure in the lid is not sufficiently developed for the inception of the insidious trachoma until the child is several years old. In regard to the causes which lead to the production of trachoma, little as may be positively known, all authorities seem to be agreed upon one fact—namely, that the liability to attacks depends most strongly upon the state of the general health at the time of exposure to the infection; in other words, that there must needs be a condition of lowered vitality due to errors of diet, hygiene, environment, etc.; and Dr. Oydyke claims that none of these errors can bring about the required condition of lowered vitality more forcibly than the evil results which arise from the presence of adenoid vegetations in the pharynx. Hence he holds that to prevent the trachoma we ought to remove the adenoids.

Trachoma in the Public Schools of New York.—W. E. Lambert (*Medical Review,* Feb. 14, 1904), presents the statistics showing the great prevalence of trachoma among the public school children of New York City. In some of the schools the percentage of contagious eye diseases reaches 20 and in one school 22.7. The only method to adopt in order to meet this evil is the careful and constant examination of the eyes of the public school children by competent inspectors of the Board of Health, and the entire exclusion from the school of all children with a contagious eye disease. The board has also established a corps of trained nurses, who visit the homes of children excluded from the schools, who explain to the parents the seriousness of the condition, direct them where to take the children for treatment, give them instruction as to the care of the eyes, the danger of contagion by the use of a common towel, basin, etc. There should be also a special hospital for the treatment of all contagious diseases of the eye. Such an institution is of benefit not only for cases of trachoma, but would be particularly useful in caring for cases of acute purulent conjunctivitis, so many of which are seen in the clinics. It is highly essential that the inspectors should be men familiar with eye diseases and perfectly competent to evert the upper lid in order to thoroughly examine the upper cul-de-sac.

PEDIATRICS

Vol.XV. APRIL, 1903 No. 4

ORIGINAL ARTICLES

A CONTRIBUTION TO THE NATURAL HISTORY OF DIPHTHERIA

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In a discussion before the Academy of Medicine (N. Y.) April 4, 1895, on Diphtheria and the value of the anti-diphtheritic serum in the treatment thereof, Dr. Joseph E. Winters[1] declared that not alone it did not give the results claimed for it but that it was actually injurious, adding considerably to the mortality by the grave lesions in kidneys and lungs that it gave rise to.

Some years later, Dr. E. Herman[2] of Brooklyn published an article in which he took the same ground, and with much elaboration and collation of statistics sought to prove the correctness of the contention of Dr. Winters, that the serum treatment is absolutely injurious, increasing the fatalities in the manner above stated.

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[1] Medical Record (N. Y.), April 20, 1895.

[2] J. Edward Herman, Medical Record, May 27, 1899.

On the other hand, the advocates of the serum treatment, the greatest in numbers, are equally as positive in their assertions that the results achieved therewith are most remarkable, and that the mortality from diphtheria since the introduction of this method has been phenomenally reduced. Kossel[1], one of the earliest writers on this theme, reports three series of cases, the first: of Ehrlich Wasserman and Kossel 233 cases with a mortality of 23 per cent.; the second: of Katz and Aronson 255 cases with a mortality of 12.1 per cent. and the third, of Roux-Martin, Chaillaux 300 cases with a mortality of 26 per cent.

Since then, many other series of cases have been reported with a mortality, if my memory serve me rightly, of about 23-25 per cent. In none has it been as low as that stated for the Katz-Aronson group.

It is not my purpose here to go into the merits of this question, as it is without the sphere of my medical activity. This, however, my former experience entitles me to say, that a comparison of fatalities of former and later statistics, *i. e.* of cases treated by the older methods in comparison with those treated after the present fashion, is not in any way just and cannot demonstrate the benefits of the serum treatment.

There can be no question that the former method of treatment, the one in vogue before the serum treatment was inaugurated, was certainly responsible for not an inconsiderable part of the fatalities. Any one of the older practitioners recalling the brushings, the syringing, the spraying, etc., in the pharyngeal forms of the affection, and all done with more or less violence, for it was but exceptionally, as rare almost as the proverbial white raven, that a young child, or even older, submitted voluntarily, will admit the truth of the above statement. The force and the violence required and the haste made necessary thereby, the manipulation in the dark, as it were, caused abrasions to be made in the pharynx, in the fauces and thus opened new channels for the invading infection to enter and under conditions when the vital resisting power was reduced to a minimum.

Again in the laryngeal form there were attempts at local treatment with the probang, attempts at spraying the larnyx and with the appearance of dyspnea, tracheotomy or intubation, measures which all more or less contributed to the mortality, and one needs but recall his experience in the families of the poor and of those with moderate means, and the statement I believe will not be gainsaid.

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[1] H. Kossel, Behandlung der Diphtherie, und Behring's Heilserum, Berlin, 1895.

In my own experience, I recall that tracheotomy did not prove to be the boon that it was held out to us to be, and intubation not the panacea that it was represented. And this was not due to a lack of skill in the performance of these operations, as the former was made in all the instances by a most skillful surgeon, and the latter by an expert laryngologist, the late Dr. Thorner, of Cincinnati.

To demonstrate the great value of the anti-diphtheritic serum a comparison should be made, if such were possible, with the mortality of a series of cases treated either medically or not at all, *i. e.* allowed to run their course without any special interference.

It is beyond question that owing to the terror of the general public for the malady, and the inculcation into the minds of the medical practitioners of the grave danger attending it and of the necessity of a most heroic treatment, there has been so much interference of one form or another that the natural course of the disease, how it would evolute if left to itself, as we have learned by observation of other pathological conditions (*e. g.* typhoid fever, pneumonia) is altogether unknown.

It might perhaps be said that we could learn this from the older writers, say of the generation before Trousseau, but it is not so. Even then, heroic treatment was deemed necessary, and there can be but little doubt that the total disregard of the hygienic requirements of the ailment as fresh air, absolute cleanliness, nourishing food and cooling drinks combined with the bleedings, the vomitings, etc. slew their thousands and tens of thousands.

This absolute lack of knowledge on this important point is the reason for the report of these three cases, more particularly of the last two, a report which I am fain to regard as a valuable contribution to our knowledge of the natural evolution of the disease, and as showing us what the *vis medicatrix naturae* can accomplish, and how important it is to bear in mind the teaching of our great colleague Jacobi, *Non Nocere!*

LARYNGEAL DIPHTHERIA

Case I.—E. R., aged eleven. A stoutly built little girl, a native of Texas and of Jewish parentage. Her father (the mother had died some months previously) had come North with his little daughter some weeks ago, and occupied a rear room, fairly large, on the second floor of a private house. The man, a very intelligent person, was in decidedly straitened circumstances.

At the request of an aunt, I called to see the little girl and found her presenting all the evidences of an oncoming attack of measles.

The further history without recurring to the dates, is as follows:

The eruption came out nicely, the body was extensively covered therewith and the malady followed its usual course without any untoward symptoms.

About one week after the establishment of complete convalescence, and when I had already ceased my visits, I was again summoned to see the little girl. She was very hoarse and had a slight hoarse cough. From my previous experience in the epidemic of measles that had prevailed a little earlier in the season, as recorded in the chapter on Catarrhal Laryngitis in Starr's American Text-book of Diseases of Children, I feared at once that diphtheria was presaged. I prescribed the tincture of aconite in small doses for the fever, gave a little antimonial wine in mild expectorant doses and 10-15 drops of Gregory's Syrup of Dover's Powder at night to give sleep. Ordered milk, beef broth and whiskey.

The case progressed, the symptoms grew more grave, aphonia became complete, the cough though apparently not very harassing, more muffled, more toneless. The respiration became more hurried, the alæ of the nose were seen to move quite rapidly. It was the sixth day of the disease and the dyspnea was very marked, and there was a sinking in of the scrobiculus cordis with each respiratory effort. The child sat propped up against pillows. Its face had a bluish tint. I made no change in the treatment, only increased the quantity of whiskey to a teaspoonful every two hours. I came back about 5 p. m. and found the distress of the child very great. The dyspnea was profound. The respiration was very labored and with each effort the scrobiculus was drawn in almost to the vertebral column. The pulse was uncountable, but still considering all things, of fair force.

As I saw the child then, I was almost certain that she could not last very long and the question arose in my mind whether to intubate or make a tracheotomy. One of these procedures was undoubtedly indicated. Then there came back to me, the fact that in all cases of diphtheria following upon measles, in which either of these procedures had been resorted to, death had followed. Furthermore, there was no possibility of having the child cared for in the way the subsequent treatment made requisite. Taking all things into consideration, I determined to do neither, but leave the case in the hands of Providence, only directing that the whiskey be pushed. About midnight, I came back and to my great surprise found the child alive. I regarded this as a favorable omen. It also seemed to me that there was some slight amelioration, that she breathed somewhat easier. The following morning the child was still more improved, and all the unpleasant symptoms disappeared very rapidly. The fever subsided very quickly after the crisis, the cough ceased and the voice gradually returned. The child slept well, began to eat, became lively and in one week after the terrible night recorded, she was as lively as a cricket, jumping about in her bed and having a good time, generally, with herself.

It was on the fourteenth day after the first symptoms had been noticed when I called in the morning and found her, as described, romping about in bed. She being in good humor, I asked her to open her mouth and let me look in. She opened her mouth widely and there was the whole buccal cavity, the fauces, the pharynx covered with a white glistening membrane. It looked as if the parts had been tapestried with white muslin. On looking carefully, I observed that one upper corner of the membrane had become detached and hung down. I took a long brush out of my case, dipped it in a solution of iodine and glycerine (v to iii) and inserted it, the child making no opposition and holding perfectly still, easily and gently under the loose fold, and sought to wind it round the brush by just rolling the latter between the fingers. As I did so the fold attached itself to the brush, curled around it and as I continued the whole membrane became detached and wound itself upon the brush, disclosing a sound and healthy mucous membrane beneath it. In this way, the whole membrane was removed, to use an expressive phrase, in a jiffy. The child made a quick and complete recovery and was soon her former self again.

Case II.—M. A., aged two and a half years; a stout vigorous boy. I was called at midnight. The child was slightly feverish and had a marked croupy cough. I prescribed ammonium bromide in solution grs. four every three hours; directed a stimulating liniment to be applied to the neck. Ordered milk, beef tea and whiskey.

The case progressed as did the other; the symptoms became graver, the respiration grew gradually more labored; the crisis came on in the same way as in Case I, though not with the same degree of severity, though still sufficiently so to have induced, had any other physician been in attendance, a resort to tracheotomy or intubation. Here likewise as in the previous case no change was made in the treatment; only the whiskey was pushed a little more, three-quarters of a teaspoonful every two hours. Then came improvement which continued unchecked. On the fifteenth day when the child was in the best of humor, I asked him to open his mouth and let me look in. He did so and there was the same glistening membrane covering the parts just as already described. By the procedure already recounted the membrane was removed and the parts beneath found sound and healthy. The boy was soon well after this.

The reason for the line of treatment pursued in these two cases was this: I had become convinced that the forcible measures already referred to were of no particular benefit. Whatever recoveries there were, were not because of them but despite of them. The routine administration of medicines without any special indications did not appeal to me any more. Some new method of treatment, a method based on some better ground should be sought for. I had just then finished reading that classic in medicine "Rest and Pain" and it struck me that this was the keynote for treatment: As much rest as possible for the inflamed part, with proper attention to the conservation of the vital forces of the patient and to his hygienic requirements, and when the two cases related presented themselves I sought to carry out the method of treatment after the manner already stated. In the second case, in every way not so severe as the first, I preferred to give the bromide, as I did not like to intrust the mother, a very ignorant woman, with so potent a drug as a preparation of opium.

Although not properly of the paper, which is merely to record these histories, nevertheless I cannot refrain from adding that for me the conclusions I should draw therefrom would be the following:

1. That diphtheria, as so many other human ailments, is a self-limited disease.

2. That placed under the necessary favorable hygienic conditions, the *vis medicatrix naturae* properly supported, if no complications natural or artificial supervene, the disease tends to recovery.

3. That even grave dyspnea, as depicted in the history of Case I, does not necessarily mean a fatal issue (as was stated by so experienced a man as J. Lewis Smith) ; that even if left to itself, nature can work out its own salvation. At the critical period, it is the crisis in the disease.

Though there are but two cases, I believe the conclusions nevertheless justified in view of the facts pertaining to the first case as already related, to wit:

(a) That diphtheria following upon measles is a most grave affection.

(b) That all such cases (referring now to my own experience), as were tracheotomied or intubated perished.

Moreover, these conclusions find full corroboration in the testimony of other observers.

Sometime in the early '80's, there appeared in one of the Medical Journals, I believe it was the *Medical Record,* a report from a Russian physician of 200 cases of diphtheria treated with lime-water administered internally alone, and with most remarkable results.

In the *Berliner klinische Wochenschrift,* 1889, Dr. Arthur Henning of Koenigsburg reported at length his method of treatment: the administration of lime-water internally; gargling with lime-water or spraying with the same when the children cannot gargle, and the application of ice externally. He stated therein that he had most wonderful success with it, both in the epidemic and the scarlatinal diphtherias. His mortality in a series of 1,054 cases was 2.7 per cent. for the two forms together, and only 0.9 per cent. for the first form alone.

In addition, there are scattered throughout the vast medical literature of the last twenty-five years, a number of reports of a similar tenor bearing on small groups of cases in which internal medication was the main reliance, at the same time some almost indifferent agent was applied topically. Thus Dr. Fruitnight (in Archives of Pediatrics 1888) reported eight cases of diphtheria treated successfully with the hyposulphate of soda internally and in spray topically.

TONSILLAR DIPHTHERIA

Case III.—Emma S., aged six. I was called to see her at 7 a.m. As I entered the room, a fairly large one on the second floor of a rather good tenement house, I observed that the child lay on a low cot just opposite the door and noticed that the chest was heaving, moving up and down with a startling rapidity. I sat down at its side and saw that the heart was beating furiously; the pulse was uncountable. The temperature in the axilla 106° F. Further than this, I found nothing. I was certain that this was the prodromic stage of some infectious malady, but which I could not as yet determine. I so informed the mother. I had to content myself with prescribing for the symptoms. I directed a mixture of infusion of digitalis and spirits of mindererus (as already described in my paper on the abortive treatment of pneumonia in children) a teaspoonful to be given every hour and a half, and as the action of the heart calmed, every two hours.

At 7 p. m., I saw her again; she was much better apparently. Heart's action very much quieted. Pulse 100. Temperature 101° F. The following morning when I called, I found the child up and dressed and walking about and in very lively spirits. I asked her to open her mouth and let me look in. She did so very nicely and I saw a very small yellowish white patch upon the left tonsil. I wanted to brush it with the iodine and glycerine mixture but the child at once jumped away declaring that I should never brush her throat. The mother said it would be impossible to make any local applications; I should institute some other treatment. I directed a teaspoonful of limewater to be taken in slowly, to be sipped, every half hour and a teaspoonful of a mild mixture of muriated tincture of iron and glycerine t.i.d. Plenty of fluid food, whatever the child would take. As the mother was a flighty woman and perhaps owing to other circumstances, the child received but scant attention and the directions given were not carried out as fully as so serious a malady would seem to require. The child though in bed did not lie still at all but jumped about therein as suited her sweet will. After the third day she could not be kept in bed. She got along famously without any interruption to her progress. About fifteen days later, I saw the child again. She was well but had a distinct nasal tone in her speech. Paralysis of the palatal muscles had supervened and confirmed in this striking manner, the diagnosis: Tonsillar diphtheria.

This case is no less instructive than the first. It teaches:

(a) That we may have a very severe infection (as shown by the very marked constitutional disturbance and the subsequent paralysis) with but trifling local manifestations.

(b) That the natural tendency of the disease is to recovery.

(c) The advantages of the administration of digitalis as a regulator of cardiac action and controller of the heat regulating centers.

POST-DIPHTHERITIC PARALYSIS AFFECTING THE GENERAL NERVOUS SYSTEM.*[1][2]

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Contrary to the view held by some, the frequency of paralysis is in direct proportion, I believe, to the severity of the general infection, although a severe form of palsy may follow a mild type of diphtheritic intoxication. The location of the membrane is of considerable importance as an etiological factor, diphtheria of the posterior nares especially predisposing to both local and widespread palsy. That age is an important factor is borne out by statistics. Gowers believes it to be relatively more frequent in adult life than in childhood. In statistics of other writers, however, early childhood, from five to six years, seems to furnish the greater number of cases. The proportion of cases of diphtheria followed by paralysis is variously estimated from 10 to 30 per cent. In 1,316 cases of the disease reported by Myers, 275, or about 21 per cent., were followed by palsy.

Pathology.—Many of the older writers and some of today have regarded the palsy as a peripheral one only, due to polyneuritis. As early as 1863, Charcot and Vulpian published a paper as the result of their investigation, from which they drew conclusions similar to those generally accepted today. Pathological changes more or less constant have been found to exist not only in the peripheral nerves, but also in the nerve trunks and roots, in ganglia, and in the spinal cord and brain and their coverings. The muscles, too, share in degenerative changes secondary to and independent of nerve lesions, especially observed in the myocardium. There seems to be a unanimity of opinion as to the direct cause of the lesion, *i.e.,* a toxin elaborated within the body by the diphtheria bacilli or "by the body itself acting under the stimulus of these microorganisms or their products" (Thomas). All agree likewise that the blood stream is the great carrier of the toxic substance although the selective power exercised in some instances, as when the palate alone is affected, accommodation paralyzed, etc., is hard to explain, unless proximity of the special structures involved renders them more vulnerable. The case of Kussmaul, which developed diphtheria of the navel soon after birth followed by paralysis of the abdominal muscles, in a measure confirms the view that proximity to the source of infection may predispose the terminal nerve endings to invasion by the toxin.

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*Read before the Northwest Medical Society of Philadelphia, October 7, 1902.

[1] For a complete bibliography, the reader is referred to Nothnagel's System of Practical Medicine, Vol. 3, English Edition.

[2] Courtesy of *Medical News.*

Many of the earlier writers and some of today contend that paralysis is due to a peripheral nerve change of a parenchymatous nature and that little or no change is found in the cord and brain. Others maintain that the cells in the anterior horns of the cord are the primary seat of lesion, the peripheral nerve change being only secondary to the spinal lesions. A more conservative view and the one more generally accepted, is that the entire neurone, either motor or sensory, may be the seat of pathological changes, the peripheral neuritis usually predominating and often existing without demonstrable change in the cord.

From a pathological study in 1896, Monicatide divided diphtheritic paralysis into four groups: "Those showing (1) purely muscular change without nerve involvement; (2) polyneuritis; (3) lesions of the spinal cord, which were either localized in the gray matter, leading to atrophy of muscles, or involved the white matter of the cord, in a similar way to that seen in locomotor ataxia or multiple sclerosis, and (4) cerebral hemorrhage chiefly due to circulatory change. This classification is accepted by many of today. To be scientifically correct, however, the fourth group, *i. e.*, the cerebral palsies, should not be classed as a palsy due to a diphtheritic toxin, inasmuch as it is accidental. Strictly speaking the term diphtheritic palsy should be applied to those palsies only which are due to direct action of the diphtheritic toxin.

Symptoms.—The blood stream being the main carrier of the toxins which give rise to nerve and muscle degeneration, the entire nervous system may share to some extent in paralysis, although single nerves are frequently picked out by the poison as a seat of greatest intensity of action or in some instances as the only seat of disease. During the second or third week of diphtheria, when convalescence is thoroughly established, instead of a gradual return to the normal, there is a slowly oncoming but progressive loss of strength, accompanied by wasting of the muscles of the extremities and, if the trunk is involved, of the thoracic muscles. In other cases the parents notice that after the child is up and around, to the regurgitation of liquids through the nose and the nasal twang of the voice, both of which began when the child was yet in bed, there is added a gradually increasing difficulty for the child to climb the stairs or even to walk. The gait becomes waddling and weak, causing the child to fall over the slightest obstruction in the way; at times too there is a decided stagger, really an ataxia. The hands and arms become weak and paralytic.

In a great number of hospital cases, seen for the first time by the physician, the paralysis is usually well advanced, accompanied by marked general emaciation. In the severer forms of paralysis the child soon becomes bedridden with inability perhaps to turn itself over in bed or to even raise the head from the pillow. The bladder and rectum sphincters may become paralyzed, causing involuntary urination or constant dribbling and obstinate constipation. To paralysis of the extremities may be added paralysis of the respiratory muscles or of the heart, when the case becomes one of great gravity. The average case, however, does not lose power so completely and after from four to eight weeks of rational treatment, gradually recovers. Soon after the onset of the palsy, the knee-jerks are found to be diminished or lost, not only in the severer forms, when absence is the rule, but even in milder forms of paralysis. Its absence has been noted in at least 33 per cent. of all cases of diphtheria with or without paralysis in some form. Its absence, however, in mild cases, is not observed until late in the disease as compared to severer forms, but its absence always indicates some change in the peripheral neurone. As a rule little if any pain is experienced by the patient and the nerve trunks are not painful when pressed upon. All degrees of severity are met with from a mild general paresis with slight emaciation, to the most complete palsy of all the muscles of the body associated with cardiac and respiratory paralysis. Symptoms of unusual gravity are paralysis of heart and respiratory muscles and of the muscles of the neck.

Instead of this general widespread palsy certain nerves may become the seat of great intensity of toxemia giving rise to special distinct forms of local paralysis. Four of these local palsies are of special interest as they occur alone or are part of a general palsy. Named in order of frequency they are palatal, ocular, cardiac and diaphragmatic. The ocular and palatal types rarely are a menace to life, but deserve study in special papers. In 275 cases of diphtheritic paralysis, collected by Myers (*London Lancet,* Vol. 2, 1900), 110 were of the palate, 69 were cardiac and 21 were diaphragmatic.

The direct cause of cardiac failure in diphtheria has been much under discussion. The myocardial changes, however, are now thought to be secondary at least to functional disturbances of the vagi and probably due to organic changes of the nerve structure. Children from two to nine years are the most frequent sufferers; after the ninth year there seems to be a rapid decrease in the number of cases affected. The onset as a rule is early, about the seventh day of the disease, although the heart has been known to be affected as early as the second day and as late as the thirty-sixth.

The symptoms most characteristic of its onset are irregularity of heart action, bradycardia, tachycardia, a lowering of the temperature (frequently subnormal), and vomiting. Of these, bradycardia, vomiting and subnormal temperature have seemed to me to be most constantly and early present, especially in fatal cases. To them may be added gallop rhythm, dilatation of the heart, a short first sound with systolic murmur at apex, blueness of the lips and other mucous membranes and a coldness of the extremities, all indicating a profound cardiac disturbance. Extreme restlessness I have noticed quite early and when accompanied by any of the above symptoms is quite characteristic. In 80 deaths collected by Myers 64, or 80 per cent., were due to cardiac paralysis. The duration of fatal cases is from two to fourteen days.

Diaphragmatic palsy may occur alone or be a part of a general paralysis. In the 275 cases of Myers, 21 were of this type; ten of the number recovered and eleven died, making 13.7 per cent. of the total deaths due to paralysis. Children between two and six years are the most frequent sufferers. The symptoms are dyspnea, retraction of upper abdomen during inspiration, weakness of voice and a tendency to the accumulation of mucus in the trachea and bronchial tubes. When the external respiratory muscles are also affected, respiration is almost impossible unless assisted.

The duration of fatal cases is from six to seven days. When the phrenic nerves alone are affected, the prognosis as a rule is more hopeful, since the external respiratory muscles are sufficient to keep up respiration until the phrenic nerve injury recovers. When, however, the weakness is very marked, tracheal obstruction by accumulation of mucus, or a secondary pneumonia, may terminate the case.

Illustrative of this form of palsy is the case of Willie C., aged four years, who developed severe local symptoms of diphtheria and profound constitutional disturbance. He made a good, although tedious, recovery and at the time of my last visit, convalescence seemed to be thoroughly established. About three weeks later, in the sixth week of the sickness, I was sent for and found the following conditions: For about a week his mother noticed that the child was listless and refused to play, but further than that noticed nothing unusual. Twenty-four hours before I saw him he seemed to have difficult breathing. Dyspnea gradually became worse, only possible with the greatest exertion, the child was semiconscious, breathing was shallow but noisy, much mucus having accumulated in the throat. With each inspiration the upper abdominal wall was retracted, the chest muscles were wasted in the extreme, the skin was ashy in hue and the lips blue. Death occurred a few moments after I arrived. Diagnosis, diphtheritic palsy of external and internal respiratory muscles.

Occasionaly after an attack of diphtheria, individual muscles or groups of muscles, supplied by a single nerve or nerve trunk, have become paralyzed without general involvement. As a rule such localized palsies are followed by a more or less permanent injury to the part. Instances of this kind on record are, paralysis of the masseters, of the trapezii and brachial monoplegia, a case of which was exhibited by the writer before the Philadelphia Pediatric Society last June. These paralyses are due usually to acute nuclear degeneration or to small capillary hemorrhages into the spinal cord.

Briefly, the history of the case of brachial monoplegia referred to, and which has never been published, is as follows: Robert B., aged two years, had a moderately severe attack of diphtheria, one sister suffering from it at the same time. Four thousand units of antitoxin were administered 36 hours after the onset and he made a good recovery in about two weeks. At the end of the third week the mother noticed that he used the right arm but little and that it gradually became quite helpless and wasting became apparent. At no time during his illness had he had difficulty in swallowing either liquids or solids. His voice was perfectly normal and he gave no evidences of weakness in other parts of the body. He enjoyed good health up to the time of his attack of diphtheria. April 2, when he was admitted to my clinic at St. Christopher's Hospital, his condition was as follows: He was plump and hearty in appearance, quite a muscular little fellow with rosy cheeks and pink mucous membranes. He was perfectly normal in his development and his trouble is confined to the right arm and hand, which hangs limply by his side and is rarely used. The muscles of the arm, forearm and hand are wasted; the wasting being more marked in the hand and forearm. The dorsal interossei are all wasted, the first most markedly so and the thenar and hypothenar eminences are flabby and flattened. At rest the proximal phalangeal joints are extended and the distal ones are flexed. There is unilateral wrist drop, supination is weak and the grip is entirely absent. Flexion at the elbow is possible, but not when resisted and elevation of the shoulder is also feebly accomplished. The knee-jerks are erratic, never absent but usually exaggerated, not spastic. The biceps tendon jerks are not obtainable. In other respects examination revealed nothing abnormal. Reactions to the faradic and galvanic currents were slightly altered quantitatively. After a month's massage, the condition improved very much. The arm was useful, wasting was confined mostly to the small muscles of the hand and it became possible for the child to grasp and hold objects in his right hand. At this time recovery is complete in the upper arm and forearm, but the wasting in the hand persists, the thumb being in the position of abduction, and the distal phalangeal joints are flexed.

The diagnosis of post-diphtheritic paralysis due to disease of the cells in the anterior horns of the cord is based on the following points: It occurred at the usual time for the diphtheritic toxin to manifest itself on the nervous system, the deep reflexes were absent only in the arms, its onset was more gradual than a polyneuritis, wasting was rapid and sharply localized, recovery under treatment was prompt except in the hand in which marked wasting persists. Injury, rickets, and cerebral palsy are easily excluded.

Finally there is a form of paralysis occasionally met with after diphtheria, as also after other infectious diseases, in which the brain alone is involved—a hemiplegia, not unlike the hemiplegia which occurs in the adult. The pathological lesion is a thrombosis, an embolism or a ruptured blood vessel, within the brain, usually in the internal capsule. The symptoms and after history differ in no respect from hemiplegia of adult life with which we are familiar.

The following case is typically illustrative of this form of palsy: Horace B., five years of age, had whooping cough and measles when two and one-half years old, but otherwise was well until January, 1902, when he had an attack of diphtheria in which there was marked glandular involvement. The infection was severe and persisted longer than the same disease in his sister, who was similarly afflicted. On the eleventh day of the disease he suddenly became unconscious and had a convulsive seizure, consciousness returning only after twenty hours. After regaining consciousness he understood what was said to him, but could not talk, could not use right arm and leg, and his face was drawn to the left. In three weeks he could say mamma and words have been slowly returning. He was able to walk some after ten weeks. His condition at present is as follows: He is of average size and well developed. He has a semiflaccid palsy of right arm and leg and walks with a typical hemiplegic gait. All reflexes are much increased, but ankle clonus is not present. Passively the leg and arm can be moved at will without any appreciable resistance. At rest the face is straight, but during strong emotion it is drawn strongly to the right. Tongue protrudes straight. There is some motor aphasia, but the patient now talks fairly well. The heart signs are negative and the kidneys show no signs of disease. During sleep athetosis is present. About six months after the onset of the palsy the child had another convulsion and several have followed since. The diagnosis is clearly hemiplegia of cerebral origin, diphtheria being the direct exciting cause. The pathological lesion, however, in this case, is not a degeneration of nerve tissue primarily, but a vascular lesion, most probably of a ruptured blood vessel.

You will observe that this form of palsy differs materially in its pathology from the other forms cited and should not, therefore, be regarded as a diphtheritic paralysis. It should be regarded as purely accidental. Influenza, typhoid fever, scarlet fever and measles may in a similar manner be followed by a like condition. In matter of time, too, the palsy develops as a rule at the height of the infection rather than during convalescence.

As a sequence to multiple capillary hemorrhages occasionally within the cord and brain, symptoms of multiple sclerosis have been observed in a few cases and at necropsy, microscopical changes similar to those of true multiple sclerosis have been observed.

Diagnosis.—Given the history of a preceding attack of diphtheria, diagnosis of the palsy offers little difficulty. Without this history, however, it may become difficult to determine the cause of the paralysis. The disease with which it is most apt to be confounded is acute anterior poliomyelitis. In severe or widespread destruction of the polar cells in the latter disease, the distribution of the palsy may be similar to diphtheritic paralysis. The onset, however, is more sudden and usually preceded by fever. Wasting also in the spinal palsy is apt to be localized rather than general, and certain groups of muscles, as for instance the extensors of arm and anterior tibial group in the leg, are apt to be the seat of wasting. In diphtheritic paralysis the wasting is general except in those patients in whom small areas in the cord are the seat of the disease, when the previous history will help to decide.

From a pseudo-rachitic palsy it may be distinguished by evidences of rickets, and by the usual paraplegic type of a rachitic palsy.

The question as to which part of the neurone is diseased probably offers greater difficulty than the origin of the palsy. Lesions of the cells in the anterior horns as a rule are small so that the palsy is limited to a single group of muscles or even to a single muscle and the damage is more or less permanent. When the peripheral nerves are affected the distribution of the palsy is usually general and the paralyzed parts tend to recover rather rapidly and completely.

The cerebral type of palsy is distinguished by the fact that it usually is preceded by a convulsion, the palsy is hemiplegic, spastic with increased reflexes and may or may not be accompanied by aphasia. It usually occurs during the height of the febrile attack.

Prognosis.—The prognosis in general is good. Even severe general palsy tends to recover under appropriate treatment, when not complicated by cardiac or diaphragmatic paralysis. Of the 275 cases reported by Myers, 80, or about 29 per cent., died. Sixty-four of the 80 deaths were due to cardiac failure and 11 to diaphragmatic paralysis, leaving but five due to a general paralysis. When cardiac failure develops either alone or associated with a general palsy, death is almost invariably the rule. The same may be said of respiratory paralysis when both diaphragm and external respiratory muscles are involved. Lesions of ganglia and spinal cord are followed by symptoms more or less permanent, although the patient's life is rarely in danger. As in adult life, the prognosis of cerebral hemiplegia is uncertain, depending upon the location and extent of the lesion. Complete recovery, however, rarely obtains. In any of the above forms of paralysis, if recovery is not complete, contractures may take place, which in turn may cause organic shortening and permanent contraction of certain muscles.

Treatment.—Treatment of diphtheritic paralysis is of unusual interest. Fortunately we have at our disposal the means of prevention in many cases or at least of modifying the severity of the palsy. Rainy conducted a series of experiments upon guinea-pigs with diphtheritic toxin and antitoxin. By these experiments he found that by injecting a large dose of antitoxin into the animal an injection of the diphtheritic toxin in excessive doses was not followed by paralysis, although in the control experiment in which the antitoxin was not used, the animal invariably developed paralysis. Not to go into detail, his conclusions in substance were that in the guinea-pig at least antitoxin was an absolute protection against paralysis when administered in sufficiently large doses soon after the introduction of the toxin.

These experiments and the experience and statistics of others furnish us with undoubted proof of the assertion that much may be done to prevent and mitigate this menace to childhood. Aside from the use of antitoxin as a prophylactic against paralysis, it is doubtful whether we have not been too slow in grasping this means offered to us for the combating of the primary disease.

As the early administration is of paramount importance for the successful recovery of the patient from diphtheria, so it is of greatest importance to eradicate from the system, or probably rather to prevent the formation within the system of toxins which act so destructively upon the nervous system. This confidence in the serum as a means of preventing paralysis has been expressed by most writers of today, and the view seems to be especially warranted by facts. The extensive use of the serum has, however, lowered the mortality rate of diphtheria very considerably without at the same time diminishing the proportion of cases which are followed by paralysis and this may seem to detract from our argument. The explanation, however, is simple. Our mortality rates are materially lowered, from which we can conclude that many severe cases are restored to health, perhaps only after protracted illness and profound infection. And it is not unreasonable to conclude that these severe cases restored to health, which under former methods of treatment would probably die, are more frequently followed by paralysis than the mild cases in which the toxin has been eradicated very early.

A second means of prevention and one which ordinarily should be mentioned first, but which I prefer to place second to serum, in order to emphasize the latter, is absolute rest. Of the more serious forms of paralysis, the heart and diaphragm suffer out of proportion to the rest of the body and the reason is apparent. The muscular system in general is placed at rest at least during the acute stage of the primary disease, whereas the heart and diaphragm are in a constant state of activity and in fact are doing a greater amount of work than in health. Parts functionally at rest are better prepared to withstand the action of toxins, especially when their nutrition is directly affected by the poison.

Absolute rest is undoubtedly imperative, not only during the acute stage of diphtheria, but for some days after the external evidences of the disease have disappeared. Since the introduction of the serum this precaution is especially important. The duration of the acute febrile attack has been shortened to four or five days in the majority of instances, in contrast to the former average duration of fifteen days, and the tendency to accede to the will of the patients and parents in allowing patients up too soon, I believe to be responsible for a not inconsiderable number of cases of paralysis.

What is true of rest as a prophylactic measure in the acute stage of the disease is doubly true of it as a curative agent after paralysis has made its appearance. As a preventive measure it ranks equally with serum, but as a curative agent it easily takes first place in our armamentarium, not only in severe heart cases, but also in mild cases of paresis. The patient should be placed absolutely at rest in bed and be given a nutritious diet. In a majority of cases improvement will follow these measures alone. Of great assistance in hastening recovery are massage and galvanism.

Among the drugs of value to be administered internally, iron and strychnine in liberal doses are probably the most satisfactory.

In severe cardiac paralysis, with bradycardia, vomiting and subnormal temperature, little can be done but support the heart by hypodermics of strychnia and supply heat to the body. Cardiac stimulants are contraindicated. Stimulation of an overworked, degenerated heart muscle will accomplish nothing but harm.

In respiratory paralysis, artificial respiration has been known to save life.

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POST-DIPHTHERITIC PARALYSIS AFFECTING THE EAR AND THROAT * **

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There are three factors which may be considered as the direct cause of post-diphtheritic paralysis. These are: The bacilli, their poisonous product, the toxin, and a by-product—probably making no attack upon the general system, but limiting its action to nerve tissue—which is called the "toxone." This last cause is recognized by Mr. Dundas Grant[1] as possibly fully explaining the rather frequent occurrence of post-diphtheritic paralysis in mild diphtheria cases treated by antitoxin. The toxin is most generally accepted as the cause. In a few cases, however, there seems to be clear evidence that the bacilli hold that relation.

The pathological picture may be varied. A degeneration of the muscle fiber has been produced in experiments by Mollard and Regaud[2] by the injection of toxin. Instead of this the dominant lesion may be a parenchymatous degeneration of the nerve, or the central nervous system may be primarily diseased. Each case will fall then under one of these three heads: (1) Muscular degeneration; (2) localized neuritis and degeneration; (3) central nerve destruction or degeneration.

The most frequent site of the paralysis is the pharynx. Myers asserts that 40 per cent. of the post-diphtheritic palsies are confined to the palate and that in 12 per cent. the palate and eye muscles are affected. The larynx may be the only part involved or it may be in conjunction with other parts, near or distant. The muscles of mastication are very rarely implicated. Grant[3] reports a cast of post-diphtheritic paralysis of the external pterygoids and other muscles of mastication which lasted fourteen months, with no impairment of taste, hearing or vision, but at the outset with a disturbance of speech and regurgitation through the nose when drinking. The sense of taste and smell are also very rarely impaired.

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*Read before the Northwest Medical Society of Philadelphia, October 7, 1902.

**Courtesy of *Medical News.*

The organ of hearing may suffer and deafness result. This must be extremely rare, for according to Gowers hearing is never impaired. I have been able to find two cases of deafness resulting from diphtheria, both bilateral. J. C. Wilson[4] reported one in 1897, occurring in a woman of thirty-three years, which persisted seven months later. H. H. Tooth[5] reported the other case in 1893, which I quote in abridged form: "Boy of five. Membrane on tonsil and in nose. Urine albuminous. One month after beginning of attack became suddenly deaf and giddy, with palate paralyzed and knee-jerks absent. In three weeks palate recovered and patient began to hear loud shouts. Four days later could hear watch one inch from right ear, but not in the left. Perosseous deafness was absolute and walking with the eyes shut impossible. Three weeks later hearing in right ear normal and the watch at six inches in the left, and in yet another three days tympanic and perosseous hearing were normal. Knee-jerks absent and he tended to fall on walking down a line. Eustachian obstruction would not account for total deafness, which occurred after all diphtheritic inflammation had vanished. Dr. Tooth's conclusion was that the auditory nerve or center (he favored the latter) had been implicated in the same way as in ordinary diphtheritic paralysis.

The location of the membrane has little if anything to do with determining the subsequent distribution of nerve or muscle degeneration. Diphtheria of the nares with very little constitutional disturbance has been followed by a remote paralysis. On the other hand a unilateral paralysis of the palatal muscles may be limited to the part immediately covered by the pseudo-membrane, and in such a case it is fair to infer that the pathological condition is a myositis rather than a nerve change.

The time of onset has been given by Woodward[6], based on a study of 7,832 cases of diphtheria—1,362 of post-diphtheria paralysis—as from the fifth to the fifty-fifth day of the disease for the palate, fourth to the seventeenth for the ocular-motor muscles, the heart usually from the fifth to tenth day, and other parts—primary paralysis—from the tenth to the fourteenth.

The duration of these palsies may be from a few days to weeks, months, and rarely, may never be recovered from. At present I have under my care a child of twelve with a paralysis affecting the larynx, of nearly a year's standing, during which time no treatment has been given. Wilson's case of bilateral deafness persisted seven months after the attack of diphtheria. On the other hand, in Tooth's patient with bilateral deafness, the hearing was perfectly restored in about seven weeks.

The restoration of function undoubtedly depends first upon the nature and extent of damage done, and secondly, when the damage is reparable, upon the treatment and care of the case.

That there may be a mortality record in paralyses of this region is evidenced by the death of a man whose symptoms were slight impairment of tactile sensation, regurgitation of food through the nose and unilateral paralysis of the palate. While drinking tea he began to cough. This ceased in a few minutes and he became distressed in breathing, simulating closely an attack of asthma. At no time was there evidence of laryngeal obstruction. He died in less than ten minutes. At the necropsy one and a half ounces of tea was found in the bronchial tubes. Hale White[7], who reports this case, gives the cause of death as "spasm of the bronchial tubes."

The treatment of post-diphtheritic paralyses may be considered as preventive and curative.

It is now generally conceded, in spite of seeming testimony to the contrary, that antitoxin prevents and never causes paralysis. The greater number of profoundly poisoned patients who have recovered through the use of this serum has added to the number of candidates for paralysis by saving their lives after the toxin has started nerve and muscle degeneration. Experiments on the lower animals have proven irrefutably that when the antitoxin follows close upon the introduction of the toxin and in a sufficiently large dosage, the chemic neutralization eliminates the opportunity for action upon nerve or muscle cells. If the injection of the antidote is delayed, the toxin has attacked the cells of the organism and only that part is neutralized which is free in the system.

Sir Thos. Barlow has recently spoken of antitoxin as "a fundamental remedy of enormous potency," and it has added the credit for preventing paralysis, which many denied it for a long time, to its credit for saving life. But here even more emphasis upon the time and dosage should be laid than when it is given to save life. The ideal way to use antitoxin is to inject it at the time the disease is acquired and in sufficient amount to completely neutralize the toxin. The nearer we come to this ideal the more lives we will save and the fewer post-diphtheritic paralyses we will see. We must bear in mind the possibility that streptococcic infection so frequently found with diphtheria may cause paralysis—as other infectious diseases, such as influenza and typhoid fever, rarely do—and would not be prevented by even the early injection of diphtheria antitoxin.

The local use of antiseptics I do not believe is needed with this better treatment at hand. Rest in bed, nutritious and easily assimilable diet, the perfect action of the skin, kidneys and bowels,—all tend to lessen the severity of the paralysis. They are certainly fundamental principles of the treatment when paralysis has occurred. Strychnine should be administered throughout the course of the disease, and is the most useful drug at our command to restore impaired function. Electricity, tonic baths, and general massage, by the general toning up of the whole body, are valuable adjuncts.

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[7]British Medical Journal, March 24, 1894.

POST-DIPHTHERITIC OCULAR PARALYSIS*[1]

By P. N. K. Schwenk, M. D.,
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Among acute infectious diseases, diphtheria is the most common cause of paralysis of the ocular muscles. All the acute febrile diseases are accompanied by a post-latent stage, and in diphtheria this post-latent stage is characterized by the paralytic trouble so frequently met with after an acute attack of this infection.

Such paralysis is an essential part of the disease, due, in all probability, however, not to the disease itself, but to the presence in the system of certain resulting toxins. Some writers even assume that the paralysis should not be viewed as a sequel of diphtheria but rather as really a part and parcel of the disease.

If there is any affection which runs an indefinite course it is that of diphtheria, as one attack predisposes to another, differing in this respect from many other contagious diseases.

As a rule the paralysis first appear in the fauces, affecting deglutition and then successively involving the muscles of accommodation and those of the extremities. One of the main points to be depended upon is the fact that in diphtheritic paralysis only a comparatively small number of muscles are usually affected at the same time. Another point is the sphincter muscles are seldom or almost never involved in the paresis.

The ciliary muscles are more frequently involved as a sequence of diphtheria than any other portion of the muscular system, with the exception of the velum palati.

Donders was the first to discover the presence of paralysis of accommodation following diphtheria, when in an epidemic of diphtheria in France, in 1860, he saw upwards of thirty cases. Mention had already been made in a report by Fauré in 1857 of six cases, where paralysis of the palate, and of "weakness of sight," once; two of strabismus. (Donders, p. 599.)

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*Read before the Northwest Medical Society of Philadelphia, October 7, 1902.

[1] Courtesy of *Medical News.*

Bretonneau Trousseau and Blanche have noted these post-diphtheritic paralyses, but attributed it to some disturbance of retinal function. Donders supposed the lesion to have been a hemorrhage in region of oculomotor nerve centers, because in this way he could explain the "dulness in the head," slight attacks of vertigo, and the after-attacks of accompanied headaches. Paralysis of the pupil or *sphincter irides* is only an occasional accompaniment, yet Donders seems to have noted it more frequently than others. (Donders, p. 899.) Shelby[1]-Bush had observed one out of twenty-four cases of paralysis of accommodation following diphtheria.

In Graefe and Sänisch's Handbuch der gesammten Augenheilkunde, Foster[2] fails to describe having seen one case.

Diphtheritic paralysis is generally bilateral, although Jefferson[3] reported one of unilateral paralysis of accommodation with mydriasis. The total hypermetropia existing after diphtheritic paralysis of accommodation, exceeds that can be rendered manifest by any cycloplegiæ after patient has recovered from the effects of the paralysis. This is accounted for by Jefferson in that the lens assumes a flatter curvature in prolonged paralysis of the ciliary muscles, than by a briefer paralysis induced by a cycloplegiac.

The paralysis of accommodation manifests itself in from two to six weeks after an attack of diphtheria and generally passes off in about the same time.

It may be assumed that recovery from an attack of diphtheritic paralysis of accommodation is more rapid in the young than in those more advanced in years.

The presence of paralysis of accommodation is observed when the patient becomes convalescent in the inability to see near objects acutely, as reading, etc., together with or without double vision. Diplopia is observed whenever one or more of the extrinsic muscles are affected.

When the external muscles are affected, it is generally of short duration, excepting when the two internal recti muscles are involved recovery seems more retarded. The external rectus muscle seems peculiarly liable to be affected. Remak[1] found paresis of external rectus in ten out of one hundred post-diphtheritic ocular lesions. The paralysis bears no relation to severity of attack of diphtheria, as the lesion has been observed after the most insignificant attack as to the seat or cause of the lesion. Donders described the angina in diphtheria to be a general disease, and that the altered blood-crasis excited a secondary morbid process in the central organ, which became the cause of the paralysis. The theory most generally accepted is that of Völcker's,[2] who places the lesion in the nerve endings in the affected muscles. If it were in the trunk of the oculomotor nerve or in the short roots of the ciliary ganglion, the pupillary reaction would be lost and the external ocular muscles paralyzed. Since eserine produces the physiological effect on the ciliary muscle the diphtheritic poison cannot affect this muscle.

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[1] Archiv f. Ophthalmologie, Bd. xvii, I. S. 265.
[2] Bd. vii, S. 172.
[3] Medical Times and Gazette, 1873, Vol. xlvii, p. 89.

Buhl and Oertel's observations agree upon the same hypothesis that the cause of diphtheritic "paralysis in general is that the nerves are pressed on and constricted by the connective tissue proliferation, and recover their functions when the action of the injurious agent has ceased."

Knies[3] asserts that all these post-diphtheritic lesions cannot be accounted for by the hypothesis of hemorrhages or inflammation in the nerves or their terminations in the muscles. He claims that some toxin is produced after diphtheria which has a direct influence on accommodation.

So you see it is impossible to account for the generally active pupils, the frequency of paresis rather than paralysis, and the bilateral character of the lesions on any other theory than the peripheral one.

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[1] Centralblatt f. praktische Augenheilkunde, 1886, S. 161.

[2] Norris and Oliver's System of Diseases of the Eye, Vol. IV, p. 702.

[3] Transactions of the Ophthalmological Society of the United Kingdom, Vol. VI, p. 386.

A CASE OF RINGWORM OF THE FACE, AND TWO OF THE SCALP CONTRACTED FROM A MICROSPORON OF THE CAT

WITH SOME OBSERVATIONS ON THE IDENTIFICATION OF THE SOURCE OF INFECTION IN RINGWORM CASES BY MEANS OF CULTURES*

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(FROM PEDIATRICS LABORATORY, N. Y.)

While the large-spored and small-spored ringworm in the scalp of a child may be easily distinguished microscopically or by cultures, nevertheless it is in ringworm of the face or body that it is at times impossible to say whether the cause is a trichophyton or a microsporon. This difficulty seems to be due to the modification of the small spore into the type of the chain-like trichophyton. This may be explainable by differences of soil, and its identity can only be established by cultures. These cases become all the more perplexing if a patch of small-spored ringworm is found in the scalp and a few scattered efflorescences on the neck and face show large chain-like spores. Since the publication of Sabouraud's classical work on ringworm, it is generally accepted that the abundant cutaneous efflorescences of herpes circinate type are due to the trichophyta. He asserted that the *Microsporon Audouini* was not contagious to the adult, but that it was confined to the scalp of the child (no secondary inoculations) and that it healed spontaneously at puberty, and was difficult to inoculate on animals. These cases which present exceptions to the above generalizations are due, in the writer's opinion, to a microsporon of animal origin. The cat and dog being the most petted animals, are the most common sources of infection. Bodin (1) describes

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*We are indebted to the publishers of the *New York Medical Journal* for the loan of the cuts and the use of this article.

two distinct forms of the small spore of animal origin, microsporon of the dog, and microsporon of the horse. The microsporon of the dog produces patches in the scalp of the child which are indistinguishable from that of the *Microsporon Audouini,* and, like it, do not attack the glabrous skin. He states that it is inoculable on all the laboratory animals, although he fails to mention the cat as the host of this fungus. The microsporon of the horse is rarely found in the human subject, and then only on the non-hairy skin as a very superficial and benign affair. Fox and Blaxall (2), in their masterly study of the plurality of ringworm fungi as found in London, report fourteen cases of microsporon of the cat. In only one case, however, were they able to trace the infection directly to the cat. In this case the mistress of the institution had a circinate patch on the chin, which she had contracted from a pet cat or kitten, both of which were affected with a typical small-spored ringworm. They give as characteristic of this fungus its rapid growth on culture media. A round, white, downy tuft shows on the fourth day. The whole surface becomes covered with the radiating hyphæ which are coarser and more bristling than the *Microsporon Audouini.* At the end of two weeks there develop concentric, brownish-yellow rings and a peripheral fringe. The principal means of identification, however, are the chlamydospores. These are very abundant, multilocular, and have bristles. In nine cases only was the scalp affected; in two, the scalp and glabrous skin; in three, the glabrous skin only. Two of the head cases presented marked kerion. Fox draws the conclusion, from the lack of its description by the French authorities, that it does not exist in France.

Truffii (3) in a recent and able study of the tricophyta, mentions the exceeding rarity of the microspora in Italy, and describes carefully the microsporon of the dog. He agrees in the main with the description of Bodin and does not mention the cat as a host.

The following cases are considered interesting as throwing some light on the difficult question of the polymorphic clinical appearance presented by the same parasitic fungus—the microsporon of the cat.

Case I.—Miss X., aged sixteen years, was referred to me by Dr. E. A. Ayers, on account of an eruption of the face of ten days' duration. The eruption commenced as a small circular patch, red, scaly and itchy. Three other patches developed on the left side of the face and one on the neck, became covered with silvery white scales, and increased in size to about half an inch in diameter. The largest patch under the left eye differed from the others in having a circinate border of papulo-vesicles, resembling slightly a "*herpès iris vésiculeux*" (Fig. 1).

When questioned as to the possible source of infection, the patient described a pet kitten which had been losing its hair in spots for three weeks, and stated that she had often held the kitten to her cheek.

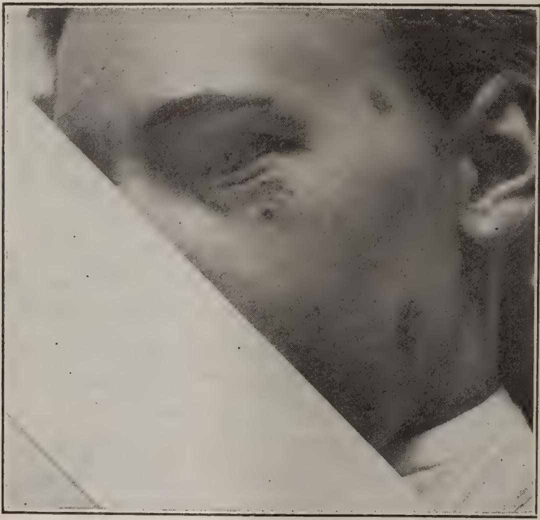

Fig. I.—*Microsporon felineum.* Miss X (aged 16). Ringworm of the face. Description: two small scaly patches on the nose between the eyes. Two similar patches on the temple and on the jaw. Under the left eye a patch about one-half inch in diameter, scaly with papulo-vesicular margin, resembling herpes iris of Biett.

Scales and downy hairs were taken from the different patches, fixed on slides with acetic acid, dried, passed through the flame, washed with absolute alcohol and ether to remove fat, and stained.

Polychrome methylene blue of Unna or that of Goldhorn sufficed in the scales to bring out the long chains of trichophyton-like spores, as well as slender, jointed, and branched mycelium. The two downy hairs shown in Fig. 2 were removed from the centers of two vesicles in the herpetic patch; these were stained by the method of Malcolm Morris[1], and presented what I considered a typical picture of the *Trichophyton megalosporon, i. e.*, a sheath of large, longitudinal, chain-like spores. These spores varied in size from four micra to eight micra, and although entirely ectothrix, they in no wise resembled the closely packed mosaic of small spores subsequently found in the hairs of the kitten suspected of having conveyed the infection. In the specimen taken from the herpetic patch, containing some of the serum from the vesicles, was found a long chain of mycelium bearing grape-like spores, one attached to each segment. This development of the external spore in the parasitic life of the ringworm fungi has never been described before, unless we except Caraté and Tokelau,

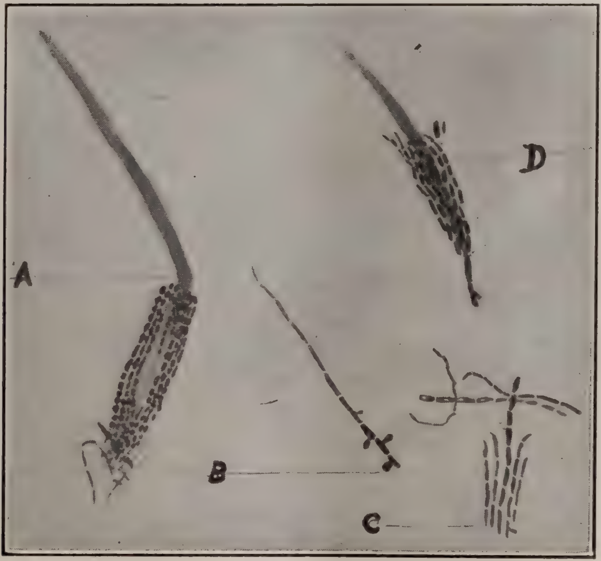

Fig. II.—Scales and hairs from the face of Case I. Stained by method of Malcolm Morris. Scale of drawing same as Fig. IV. A and D, epilated downy hairs from the impetiginous patch. Showing the sheath of large chain-like spores. B, building mycelium with grape-like spores. C, cluster of chain spores.

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[1] The Malcolm Morris method of staining the trichophyton is as follows: (1) Alcohol and ether. (2) Stain for five minutes in gentian violet, 1; absolute alcohol, 20; aniline water, 30. (3) Iodine solution, one minute. (4) Aniline, plus two drops of nitric acid. (5) Aniline. (6) Xylol. (7) Balsam.

the fungus of which is more of an aspergillus than a trichophyton. It is possible that the fluid in the vesicle afforded an ideal culture medium for this form of spore reproduction.

The kitten, which was brought for examination on the next visit, was found to have a number of ringworm patches on the face, ears, abdomen, and sides of the body. The two patches here shown (Fig. 3) in sharp contrast by an epilated zone around each patch, were oval in shape and about an inch in the long diameter. The skin was thickened and covered with fine white scales and spores of the fungus. The hairs were broken and stubby. When the diseased hairs were epilated they broke off just below the skin and to the naked eye could be seen to have a coating of spores. These hairs examined under the miscroscope in caustic potash solution, or fixed and stained as before described, revealed the closely packed, tesselated arrangement of the *Microsporon Audouini,* the only noticeable difference lying in the absence of the long endothrix mycelium, in the spores being smaller by one or two micra, and in their being entirely ectothrix. In the scales, only isolated spores, but no mycelium was found.

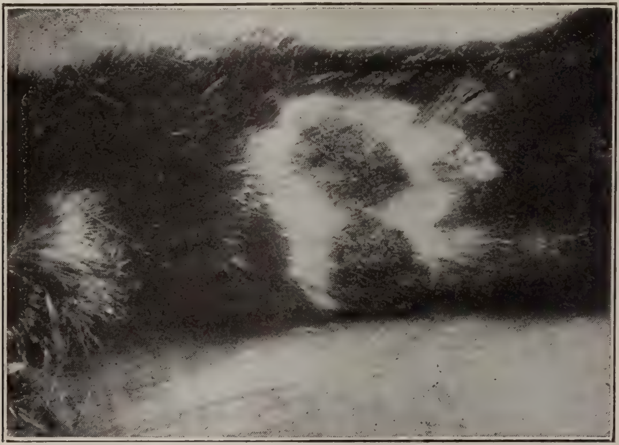

Fig. III.—*Microsporon felineum.* Source of infection in case of ringworm of the face. (X) Description: The two oval patches here shown in sharp contrast by epilation of a surrounding band, were about an inch in diameter, stubby hairs many of which were coated with spores; skin scaly and thickened. There were patches on the kitten's face, abdomen, chest and back.

A biopsy was made on one of these patches by means of the Fordyce skin punch, the section was hardened in alcohol and imbedded in paraffin. Sections stained by the method of Morris (Fig. 4) reveal graphically the manner by which the fungus invades the hair follicle. The large bulbous and branching ends of the invading mycelium can be seen to extend between the inner root sheath and the hair shaft down to the level of the junction of the derma and connective tissue (Fig. 4, G). At the point marked F (Fig. 4) the filaments seem to break up into cuboidal segments, which can be seen at first to preserve a distinct chain-like arrangement until, becoming more closely packed by the continual crowding up from below of more spores, they assume the typical polygonal or mosaic appearance. As the hair grows this sheath is carried one or two millimeters above the surface of the skin as a white powdery mantle. A cross section of one of the hairs fails to reveal the presence of the fungus within the hair shaft. When a comparison is made between the chain-like spores in Fig. 2 and the large bulbous mycelium in the deepest portion of the follicle, Fig. 4, an explanation of the mistaking of a microsporon for a trichophyton can be found, *i. e.,* the large jointed mycelia around the downy hairs were immature forms of the microsporon which had not yet broken up into the closely packed mosaic of spores.

Cultures made from the hairs of the kitten and from the ringworm patches of Miss X gave, on maltosed agar, on glucosed agar, on beer-wort agar, and on placenta-glucosed agar, absolutely identical growths. On beer-wort agar (made by adding one-and-one-half per cent. of agar-agar to the sterilized and filtered beer-wort obtained from a brewery, neutralized and found to contain about four per cent. of maltose) the most abundant and striking cultures were obtained. In Erlenmeyer flasks, kept at room temperature, the growth showed itself on the fourth day as a downy tuft which rapidly spread radially, the hyphæ being very coarse and "hairy." About the tenth day the center became decidedly yellow. At the end of two weeks, the culture presented its most typical appearance and might be described as a large, flat, circular, silky growth with a central button around which was a depressed "chamois" colored area. Around this was an elevated white zone, surrounded by another brownish-yellow circle. The margin was a delicate feathery fringe with a decided *tangential*

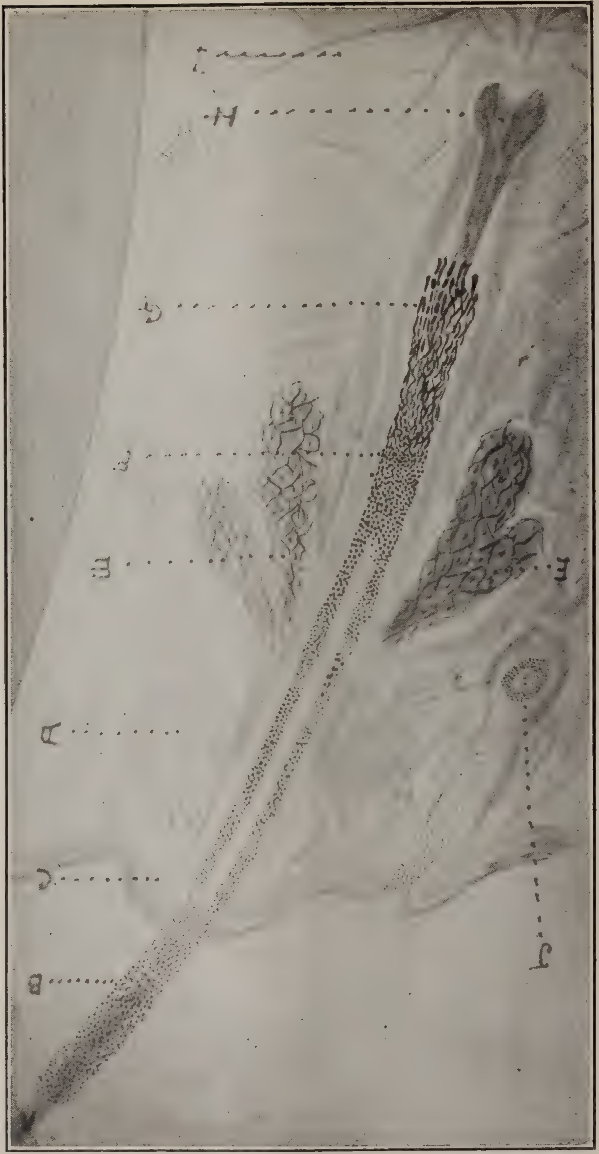

Fig. IV.—Semi-diagrammatic drawing of a section of cat's skin. Hair follicle invaded by the microsporon. Stained by M. Morris method. Scale of drawing is in such proportion, that each spore at (B) represents a spore four micra in diameter in the section. A, Hair shaft. B, Sheath of spores, enveloping but not invading hair shaft. Entirely ectothrix. C, Epidermis. D, Dermis. E.E, Sebaceous glands. E, Point at which the invading mycelium breaks up into cuboidal spores which become packed into the mosaic or tesselated appearance. G, Bulbous ended portion of the invading mycelium. Root sheath widely separated from the hair shaft. H, Hair bulb. I, Connective tissue. J, Cross-section of hair.

inclination to the left. This tangential fringe has only been observed in this cat ringworm and only on beer-wort agar, and gives to the margin of the culture the appearance of a "circular saw." This uniform deviation of the fringe cannot be explained by any trick of inoculation or contraction of the medium, or it would appear in other fungi which were tried, such as the *Microsporon Audouini* and the *Trichophyton ectothrix.* The case of Miss X and the kitten gave cultures which were identical with Fig. 5. The "chamois"-skin colored and brownish rings owe their color to the abundant development of fusiform, multilocular spindles, or chlamydospores. These chlamydospores are oval in shape and vary in size up to 20 micra by 60 micra, and their granular protoplasm is divided into from five to ten quadrangular compartments, by partitions which seem to be continuous with the cell wall. When stained, the quadrangular spaces are deeply colored, while the partitions and cell wall remain clear or only faintly colored. These fusiform bodies are reproduction forms common to the trichophyta and the microspora, but have numerous points of distinction. The microsporon chlamydospores present numerous short spines at the apex of the external cell wall. These bristles are not found in the trichophyton spindles. The trichophyton chlamydospores are much narrower, and usually have long and pointed filaments projecting from the distal end of the spindle, which Fox calls "whips." These "whips" are absent in the microsporon spindles.

Studied in the hanging drop of glucose bouillon or beer-wort, in the moist cell of Sabouraud or Bodin, the inoculated spindle can be seen to send out branches of mycelium from each compartment. These branches form a dense interwoven trellis, which at the end of ten days reaches maturity and develops chlamydospores at the end of the filaments. The hanging drop can then be dried in the incubator, fixed with acetic acid in the flame, and stained as before described. When the chlamydospores are mature the mycelium shrivels and ceases to take the stain (Fig. 6).

On a three per cent. glucose agar, made with placenta bouillon, the growth has particularly long aerial filaments, which have a silky gloss and most geometrical plications. There is only a faint development of the yellow color, due to the scarcity of spindles. The identity of the fungus from the two sources is well shown

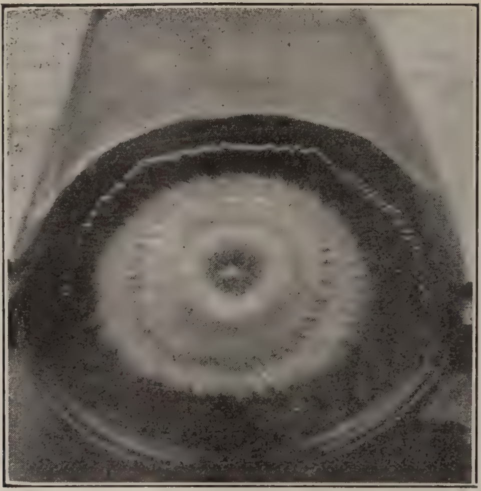

Fig. V.—*Microsporon felineum* (X. aged 16). Culture on beer-wort agar from ringworm of the face (2 weeks' growth). Description: Large, flat, circular downy growth. Central button in buff-colored area. Concentric ring of buff color, with tangential fringe radiating to the left.

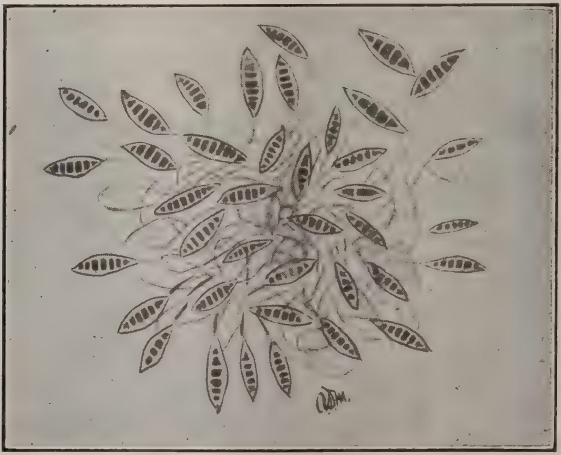

Fig. VI.—Multilocular spindles or chlamydospores in hanging drop culture of beer-wort. Inoculation made from ringworm of the cat. Spindles are about 20 x 60 micra, and are divided into from five to eight compartments. When the spindles are mature the mycelium bearing them dwindles and ceases to take the stain.

in cultures at the end of two weeks on placenta-glucose (three per cent.) agar. Figs. 7 and 7a.

This placenta-glucose agar is made in the following manner: A human placenta, weighing about five hundred grammes, is chopped fine and soaked over night in one liter of water. Squeeze out, boil, and skim. Add glucose 30, peptone 10, sea salt 5, boil, neutralize, and filter. Add agar-agar 20, sterilize at 120° C. for ten minutes, filter, distribute in flasks. After these are sterilized at 115° C. for fifteen minutes and allowed to solidify, they are ready to be used. This medium is particularly good for all the hyphomycetæ, and has been recommended by Gaston (4) as a medium on which he has obtained a culture of the *Microsporon furfur.*

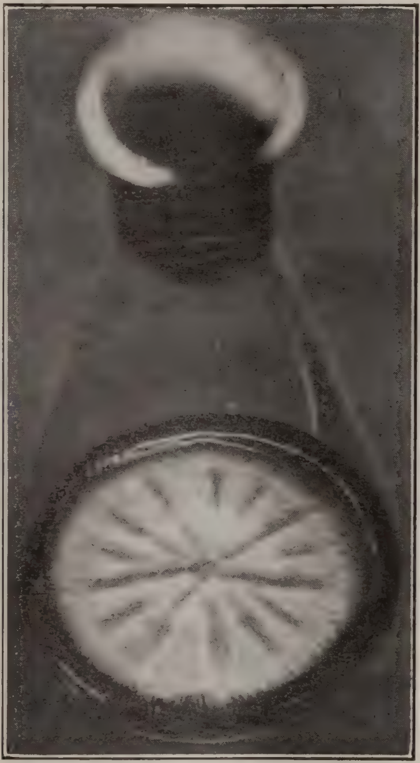

Fig. VII.—Microsporon of the cat. Taken from the face of Miss X. Two weeks' growth on placenta agar (glucosed).

This microsporon of the cat shows a marked tendency to pleomorphism, or the development on cultures kept at 37° C. for some weeks, of heavy white tufts which Bodin (5) has called acladium. This form of pleomorphism, which he has studied and described in microsporon of the horse and of the dog, once developed, can be carried on indefinitely in cultures and can only be

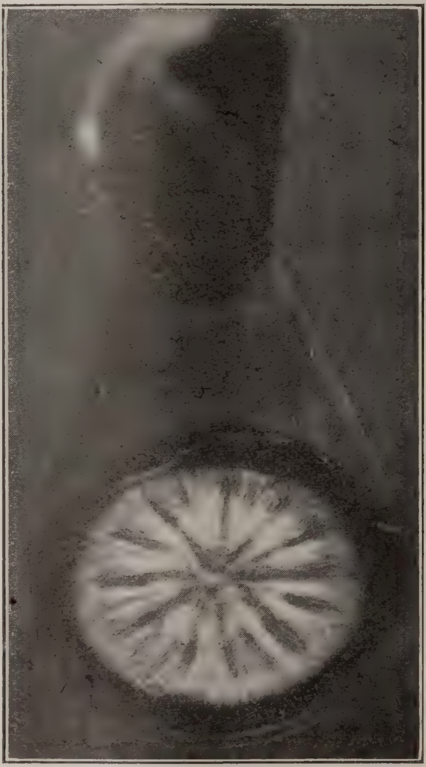

Fig. VIIa.—Microsporon of the cat. Culture taken from the cat. Two weeks' growth on placenta-glucose agar. (Culture from the scalp of case E, identical with the above.) Note: The entire flask is shown in two cultures to illustrate the method of photographing without destroying the flask. The camera is tilted to an angle of forty-five degrees to the surface of the culture. The flask is placed so that the rays of light will fall upon the growth from the side opposite to the camera and at the same angle. The rays of light thus entering and leaving the Erlenmeyer-flask at right angles to the sloping sides, all reflection from the flask is avoided.

brought back to its original form by inoculation in an animal. In the acladium form he describes the tufts as being composed of erect, slender, long jointed aerial hyphæ, bearing small round or oval spores. These spores are from two to four micra in size, and are attached laterally to the mycelial segments (Fig. 10, E.). My own study of the pleomorphism of the microsporon of the cat has not been carried far enough to report, except to say that the hyphæ do not bear external spores, that the type remains constant, and that it is not a mould.

Experiments on Animals.—Two young guinea-pigs were prepared for inoculation by shaving an area, an inch by two inches, on the back. The skin was scrubbed with soft soap and ether, then scarified, and inoculated from pure cultures on beer-wort agar. Cultures were taken from the tangential type of two weeks' growth. The guinea-pig inoculated from the culture obtained from the cat showed, on the eighth day, an erythematous patch, which, on the tenth day, was well marked and circular, with ac-

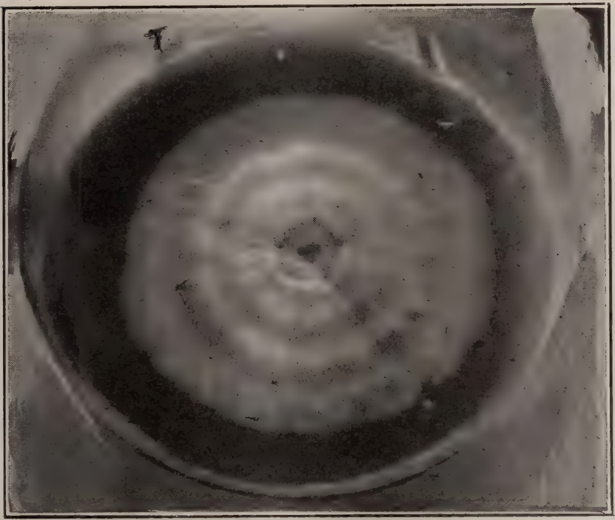

Fig. VIII.—*Microsporon felineum* (E, aged 10). Culture in Erlenmeyer flask on maltose (2 per cent.), lactose (1 per cent.) agar. One month's growth at room temperature. Description: Large, downy, circular growth with a pentagonal buff-colored depressed center from which radiate five plications. Concentric buff-colored bands.

cumulation of epidermic scales. At the end of two weeks the ringworm was typical, and presented almost the same aspect as in the cat, *i. e.* stubby hairs, red and thickened skin, with powder-like spores and scales. The epilated hairs showed typical mosaic of spores. A section of skin taken from the patch showed, on staining in the microscopical section, the same ectothrix sheath of small spores. In addition, specially well marked in the downy hairs, were endothrix chains of mycelium; not slender filaments, but larger even than the spores comprising the sheath.

The guinea pig inoculated from the culture of the case of Miss X developed a patch of ringworm at the end of two weeks, in which there was not so much inflammatory reaction, but which gave the same mosaic of spores around the hair roots. All the foregoing data were useful in tracing the source of infection to a microsporon of the cat in the following two cases.

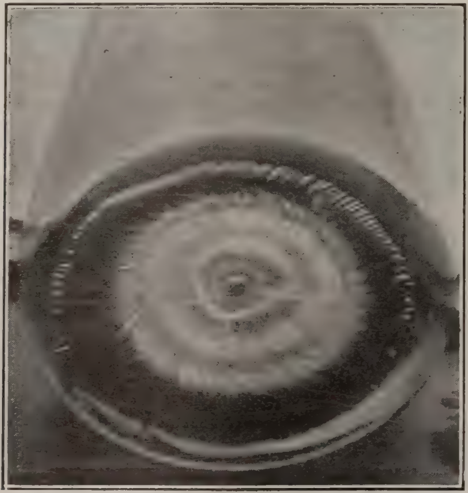

Fig. IX.—*Microsporon felineum* (E. aged 10). Ringworm of the scalp. Culture on beer-wort agar (2 weeks). Description: Large, flat, circular growth with a central button around which is an area of a buff color. Concentric buff-colored rings with a tangential fringe.

Case II.—E., aged ten years, the daughter of well-to-do parents, came under the care of Dr. P. A. Morrow, for an obstinate ringworm of the scalp as well as two circinate patches on the neck. Some of the suspected hairs were sent to me for an examination, and under the miscroscope the hairs presented the typical appearance of the *Microsporon Audouini.* Pure cultures on maltose-lactose agar in Erlenmeyer flasks gave, at the end of two weeks, the typical rapid growth with concentric yellow and brownish rings, and the white feathery fringe at the margin (Fig. 8). On beer-wort agar, at the end of two weeks' growth, it gave a culture absolutely identical, even to the tangential fringe (Fig. 9) with that obtained from the cat, and from case I. In glucose-bouillon drop cultures the same form of reproduction by chlamydospores was found. The color bands contained the same profusion of spindles. On glucosed (three per cent.) placenta agar

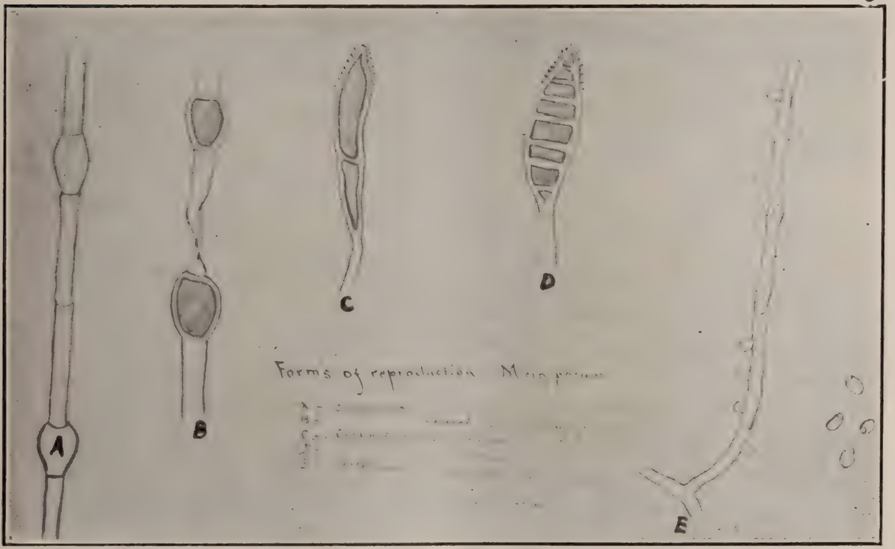

Fig. X.—Diagram showing the three forms of reproduction of the microsporon. A, B, reproduction of Endoconidial. C, D, Chlamydospores. Each segment capable of giving origin to a mycelium. E, Acladium form of spore bearing. Found in old cultures that have undergone pleomorphism (after Bodin).

the identity was still further established, as shown in Fig. 7a. The child's mother, who was questioned as to the source of infection, admitted that, while the child was most carefully watched as to children associates, she was very fond of cats and could not be restrained from picking up and caressing strange cats or kittens.

Case III.—Charles T., aged eight years, applied for treatment at the New York Hospital, out-patient department, Dr. Morrow's class this year, for a patch of ringworm in the scalp. The patch was about an inch in diameter, on the back of the head, and seemed to be a typical small-spored ringworm. The boy admitted as source of possible infection another boy in the public school whose head showed a number of bald spots. A microscopical examination of the hairs revealed a *Microsporon Audouini,* but cultures on beer-wort agar and glucose agar gave the same yellow and brownish concentrate rings with the same forms of chlamydospores. In this case the ringworm was of undoubted animal origin, although the patient might have contracted it from his schoolmate.

As to Treatment.—On the glabrous skin the affection is a trivial one, yielding to a few applications of tincture of iodine, but in the scalp it requires all the patience and skill of the practitioner, and from the number of remedies prescribed, all the resources of the materia medica.

Truffi (6) in conclusions drawn from experiments made by Calderone and previous experimenters, as well as from his own, on the antiseptic action of different agents on the hyphomycetæ—experiments made on cultures, on the affected hairs, and on the patient's scalp—comes to the conclusion that the resistance of all the parasitic fungi (achorion, trichophyton, and microsporon) to chemical agents is diminished by using an agent which removes the fat from the scalp and hairs, such as alcohol and ether, or carbon bisulphide. Hence it follows that ointments having an oily base are not so good as solutions in alcohol and ether. He finds that salicylic acid ten per cent. in either, kills the tricophyton spore in five minutes. Chloroform for twenty minutes prevents its growth. Resuming, he states that the substances most active against these fungi in parasitic life are corrosive sublimate, carbolic acid, salicylic acid, tincture of iodine, chloroform, carbon bisulphide and among gaseous substances, sulphur dioxide. But he insists upon the necessity of epilation. Calderone (7) finds confirmation of the favorable use of tincture of iodine and glycerin, equal parts (such being part of the treatment at the Ecole Lailler, Paris) in the fact that infected hairs placed in this solution for five minutes fail to give cultures. Morrow uses chrysorobin ten per cent., salicylic acid five per cent. in traumaticin (liquor gutta perchæ).

In view of the long and tedious treatment of ringworm of the scalp, as well as of the enforced absence from school, the danger of contracting these diseases from caressing animals should be called to the attention of parents.

Résumé and Conclusions.—First, that differences of soil modify the clinical picture of a skin ringworm as well as the microscopical appearance of the fungus.

Secondly, that in the fluid of a herpetic vesicle the mycelium of a microsporon may produce external grape-like spores.

Thirdly, that the yellow and brownish bands and the tangential fringe on beer-wort agar can be used to identify the source of infection in ringworm of the cat.

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[3]Truffi. Richerche sperimentale sulla tigne. *Giornale italiano delle malattie venerie e della pelle.* 1902, fasc. i, p. 67.

[4]Gaston and Nicolau. *Annales de dermatologie et de syphiligraphie.* April, 1902, p. 414.

[5]Bodin. *Les champignons parasites de l'homme,* 1902, p. 142.

[6]Truffi. *Loco citato.* p. 94.

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SOCIETY PROCEEDINGS

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN

An Ordinary Meeting of this Society was held at No. 11 Chandos Street, London, W. on Friday, January 16, 1903.

Dr. L. Shuttleworth in the Chair.

A Case of Syphilitic Endarteritis and Nephritis in an Infant.—Dr. G. A. Sutherland and Mr. Thomson Walker read a paper on a case of syphilitic endarteritis and nephritis in an infant. The child showed signs of syphilis, with paralysis and following rigidity of the right arm, while the lower extremities became rigid and the head was retracted. There was albumin in the urine. At the autopsy there were found endarteritis of the cerebral arteries and softening of the left frontal lobe of the brain. There was diffuse interstitial nephritis. Another case of interstitial nephritis due to the same cause was also described. The authors considered that the most important change in this form of arteritis took place in the adventitia and that syphilitic arteritis was a secondary and not a tertiary manifestation of the disease. The etiology of nephritis in children was often obscure and the importance of syphilis as a cause was greater than was generally supposed. Many cases went probably unrecognized, owing to the slight changes visible to the naked eye.

The Chairman in thanking the authors for their valuable contributions, suggested that members might compare their experiences with regard to interstitial nephritis occurring in subjects in whom there was reason to suspect hereditary syphilis.

Dr. George Carpenter related that a syphilitic female infant, aged five weeks, developed, while under observation, the signs of Bright's disease,—symptomatic and microchemical. She was treated with mercury for some weeks and subsequently died. At the postmortem the kidneys appeared natural to the naked eye, but on microscopical examination definite changes of patchy distribution were found. There were interstitial and catarrhal changes. The glomeruli also were large and over-nucleated, and some of their capsules were thickened. He also gave a case of a female child aged six months, syphilitic, who developed extreme general dropsy, but was lost sight of.

Dr. Leonard Guthrie said he had felt special interest in the case of Dr. Sutherland and Mr. Walker, because the views expressed by them bore out to some extent the ideas he brought before the Society some two years ago. When describing a case of chronic interstitial nephritis in a girl aged nine, he suggested, though he had very little to go upon, that the condition might be due to syphilis. Otherwise it was difficult to explain. In children it was almost impossible to attribute chronic interstitial nephritis to the ordinary causes—gout or alcohol; nor yet to post-scarlatinal or parenchymatous nephritis. Acute interstitial nephritis in children might be fatal, but in less severe cases the subjects of it might live on to a considerable age, and ultimately die of granular kidney due to hereditary or perhaps acquired syphilis. He thought the argument was supported by statistics from lunatic asylums. It had been stated that at Colney Hatch Asylum seventy per cent. of the cases which died had granular kidney.

Dr. Robert Hutchison showed specimens of organs from a case which probably belonged to that group, from a boy aged seven who was admitted to the London Hospital, with very large dilated heart, and considerable albumin in the urine. He died two or three days after admittance. He showed signs of embolism in some of the large arteries, and had gangrene of the scrotum and one foot. At the autopsy one kidney was found to be very shrunken, one and one-half inches in length, and the other appeared to be hypertrophied. There was no history of syphilis.

Dr. Sutherland replied. Mr. Thomson Walker said the small kidney, in his opinion, was a non-developed organ, and likely that the heart-changes were separate from those of the kidney.

Traumatic Cephalo Hydrocele.—Mr. Thomson Walker showed this specimen. The case was a boy of thirteen years, who received a blow on the head, producing a scalp wound. The wound healed rapidly, but some months later a pulsating swelling appeared at the seat of injury, having all the characters of a fluid swelling communicating with the interior of the cranium. After some years the tumor diminished and finally disappeared. The boy died of scarlet fever. A scar about one inch in length was found in the scalp. The calvarium showed the following: An irregular gap about one and one-half inches long, varying in breadth from one-sixteenth to six-sixteenths of an inch, was in the line of the coronal suture to the left of the middle line. The inner half of the gap followed the coronal suture, the other half passing outwards and backwards into the left parietal bone. From the outer limit of this the remains of a repaired fracture could be traced for another one and one-half inches where it again joined the coronal suture. This part showed almost complete repair on the outer surface, only two small gaps being left, but on the inner surface the attempt at repair was very slight. The edges of the large gap were smooth and rounded, the anterior edge being bevelled at the expense of the inner table, while the posterior was bevelled the expense of the outer table. On the inner surface of the frontal bone there were numerous pits and depressions of varying size, apparently due to pressure. Beneath the gap in the cranium the dura mater was deficient and there was evidence of old-standing injury to the cerebral substance.

The condition is uncommon, and when present usually cured by pressure. It has been suggested by Hoenig, that if pressure or aspiration fail to relieve the condition the bone should be exposed, the pericranium stopped up and stitched over the gap. This has apparently not yet been attempted. Mr. Thomson Walker also showed a specimen from a punctured fracture of skull. In this longstanding middle ear suppuration had been present, and during life obscured the traumatic nature of the meningitis.

Mr. Sidney Stephenson showed a case of paralysis of the left cervical symphathetic nerve in an infant, aged five months. The symptoms were typical, *e. g.*, the upper lid drooped markedly, the pupil was small and did not dilate to darkness, the eye appeared rather shrunken, and intra-ocular tension was lowered. A puckered scar lay about one inch above the outer third of the left clavicle immediately behind the posterior border of the sterno-mastoid muscle. The history of the case was most instructive. Eighteen days before the child fell under Stephenson's observation the baby was brought to the Northeastern Hospital for Children suffering from a large and hard swelling in the left side of the neck. An oblique incision was made over the swelling, and a deep abscess opened by Hilton's method. It extended to the mucous membrane of the pharnyx which led to the diagnosis of a retropharyngeal abscess. No bare bone could be felt. The eye-symptoms had followed closely upon the opening of this abscess.

Dr. Cantley asked whether there was any difference in the blood vessels on that side or any difference in the function of sweating on that side. Dr. Sutherland asked that members should be afforded another opportunity of seeing the child at a later date.

Mr. Stephenson, in reply, said he would try to get the parents of the child to attend with it at the next meeting. He had observed no difference in the blood vessels of the two sides of the face. The mother assured him that the baby never sweated.

MICROCEPHALY.—Dr. Leonard Guthrie showed an infant, aged five months, subject to microcephaly, with unusual maldevelopment of skull. The frontal bone was small, narrow and retreating, the superciliary ridges, zygomas and temporal ridges were unduly prominent. The interfrontal suture was marked by a bony ridge. The parietal bones were small and the left overlapped the right. No anterior fontanelle could be felt. The occipital bone showed a beak-like projection, and overlapped the two parietal bones. Thus the deformity of the skull seemed to be secondary to ill development of the brain. The child's features were normal and did not suggest imbecility. No other deformity was present, but there was general spasticity of the limbs. The arms were flexed and the fingers clenched, so that the nails had abraded the skin of the palms. The lower extremities were rigid, and the reflexes exaggerated. No history of similar or of any congenital deformities in other members of the family. Such cases he believed were freaks, and their etiology was unknown. Operations, he agreed, were useless, but sometimes craniectomy he thought might relieve when signs of premature ossification of sutures and consequent cerebral pressure existed.

Mr. Tubby related some experiences of such cases, and so far as he was able to judge, considered craniectomy quite powerless to alter the condition. Dr. Cantley, Dr. Hutchison, Mr. Pernet, the Chairman and Dr. Sutherland discussed the case, and Dr. Guthrie replied.

Dr. Charles W. Chapman read a paper upon a case of dilatation of the stomach in a girl of eight years. The patient was unusually bright and intelligent. She had been accustomed to unsuitable food and irregular meals. The father was healthy, mother neurotic. The mother had noticed the child's health to be failing for the last two years. Early in 1901, while the child was having a dancing lesson, splashing was heard, in consequence of which the parents sought advice. The splashing was heard on succussion and palpation. Upon alteration in diet, medicine and reduction of lessons, the child recovered completely.

The case was discussed by Dr. Sutherland, who said it was that class of case which was associated with cyclic albumenuria. Children of nine to thirteen years had a tendency to weakness of all abdominal organs. Dr. Cantley also discussed the case and Dr. Chapman replied.

Dr. George Carpenter read notes of a case of acute primary thyroiditis, unassociated with specific symptoms in relationship to the gland, in a rickety infant aged fourteen months, which suppurated, was surgically treated and recovered. He called attention to the rarity of the condition, even when starting as a complication of the specific fevers, and pointed out that in some reported instances, induration of the gland and not suppuration had resulted as a sequence of inflammation.

PHILADELPHIA PEDIATRIC SOCIETY

Stated Meeting, February 10, 1903.

PRESIDENT D. J. M. MILLER, CHAIRMAN.

A CASE OF CONGENITAL HEART DISEASE.—Dr. M. B. Fussell exhibited a case of congenital heart disease in a boy of five years of age. Two previous children of the child's mother had been normal. The mother had been well throughout this pregnancy and at the time of the child's birth. The child had presented no evidences of disease at birth, and there was no record of the condition of his heart until early in 1900. The mother stated that when the child was very young he frequently had attacks of cyanosis and dyspnea, and at such times he became semiconscious. The attacks had increased in severity, and would come on particularly when he was running about or when he became angry.

The physical examination made when the child was two years and three months old showed marked clubbing of the fingers, moderate enlargement of the cardiac dulness upward and to the right; a rough systolic murmur over the entire anterior portion of the chest, its greatest intensity being at the upper part of the heart dulness. The child has been occasionally seen since this time. He has had well marked diphtheria, but passed through the attack without a bad symptom, antitoxin being used.

In November, 1902, it was noted that since the previous examination the child had developed; but that the attacks of dyspnea, cyanosis, and syncope were becoming more marked, the boy being unable to walk a square without the occurrence of an attack. They would also frequently occur when he was apparently entirely quiet. He showed marked cyanosis, with clubbing of the fingers, dilatation of the superficial veins, prominence of the abdomen, a bowing forward of the spine, and a rounding of the chest. The heart dulness had increased markedly toward the right. The pulse was equal on both sides. The pupils were normal. There was no capillary pulse. The heart's action was slow and regular. The murmur was present as previously described, being marked over the aortic cartilage. The second sound in this region was also accentuated. Both the murmur and the second sound were less loud over the pulmonary cartilage. The murmur was indistinctly heard in the vessels of the neck; the point of greatest intensity of the murmur was at the junction of the first and second parts of the sternum, while the second sound was loudest between the nipple and the sternum in the fourth interspace. The jugular veins did not pulsate. The edge of the liver could be plainly felt; the spleen was not palpable. There was no edema. The lungs were normal. When exhibited to the Society, the conditions were much the same as those last noted.

Dr. Hamill reported a case of congenital heart disease. The patient was a boy aged nine years. He had been cyanosed since a few months after birth. He had always been dyspneic but the dyspnea had become much more marked in the past six months. He was subject to frequent attacks of epistaxis. He was well developed and had advanced well in his studies. He had precordial pain and cardiac palpitation. He had no defect of vision.

When seen in the dispensary two days before his death, his lips and all visible mucous membranes were purplish black; the entire skin of his body was a dull leaden color with intense congestion of his hands and feet, the extremities of the fingers and especially the nails being of much the same color as the lips. His dyspnea was extreme; his cough violent and he was expectorating large quantities of liquid blood and having epistaxis. During his coughing he had severe precordial pain which caused him to clutch his precordia.

The chief points of interest in the physical examination were the extreme pulsations of the veins of the neck; the presence of a tortuous and anomalously located external carotid artery which was situated on the left side and almost underneath the mastoid process. It was pulsatory and expansile and about the size of a pigeon's egg. The apex beat of the heart was palpable in the fourth, fifth and slightly in the sixth left spaces three-quarters of an inch outside of the M. C. L. There was no thrill over any portion of the chest. The heart dulness in the final examination began above at the first rib and extended to the right M. C. L. and to the left anterior axillary line. On the occasions of the early examinations the only murmur present was a rather faint systolic murmur heard best in the third left interspace close to the sternum. The murmur accompanied the first part of a divided sound. On the occasion of the last visit, when the heart was acting violently, there was heard in addition to this systolic murmur a distinct presystolic murmur, having the characteristics of the murmur of mitral stenosis. The first sound had lost its divided character and was short, sharp and high pitched.

An examination of the eye-grounds which was made by Dr. Posey, showed the following remarkable condition: The eyeballs were prominent; the conjunctival vessels, both those of the globe and of the lids, swollen, especially the veins, giving the eye a dark purplish appearance. The pupils were large and the media clear.

The findings of the ophthalmoscope showed a neuroretinitis of marked degree. The retinal arteries and veins were greatly swollen and tortuous, resembling large angle worms. The head of the optic nerve was obscured by the swollen retina and there were a few small hemorrhages into the nerve fiber layer of the retina close to the disc. The light reflex from the vessels was greatly broadened, that of the veins the more so. Dr. Posey remarks: "I do not remember ever to have seen retinal vesssels of a larger caliber, the retinal veins appearing to be increased to three times their normal size."

Dr. J. P. Crozier Griffith referred to the fact that in these cases we can rarely make more than a probable diagnosis. Absolute diagnoses are likely to be found disappointing, if the case comes to autopsy. The last case that the speaker had seen he did not recognize during life, although he had studied it carefully. The patient was a child five months old, who had had a febrile attack two months before, in which the heart grew very weak without any evident reason. The next day the child was better; but after this it occasionally exhibted some cyanosis with momentary apnea, which appeared to be due to laryngospasm. Dr. Griffith thought that the child had status lymphaticus, as there was no evidence of cardiac disease. Pneumonia, however, came on, and was fatal. During this attack, the child again exhibited pronounced cyanosis. Among other lesions, the postmortem showed two large openings in the auricular septum.

The speaker believes that the cyanosis in this case was due to the abnormalities in the auricular septum. This case is evidence against the constant truth of the view usually expressed, that cyanosis in congenital heart disease indicates the presence of either an anomalous distribution of the vessels or pulmonary stenosis. It shows that cyanosis does at times occur in cases of perforate auricular septum. That no murmur was present was to have been expected, as it is very commonly absent with this lesion.

Dr. Griffith believes that pulmonary stenosis is present in Dr. Fussell's case, although he did not feel willing to state this positively. The murmur is certainly that of perforate septum ventriculorum, being heard loudest at the middle and the upper part of the sternum. This condition, however, is usually associated with pulmonary stenosis. If one considers that perforate septum ventriculorum is present in the patient exhibited, it is probable that pulmonary stenosis is present also. The cyanosis tends to support this view. As, however, the pulmonary second sound would be feeble if the pulmonary artery were much narrower, we have still to explain the accentuation of the pulmonary second sound. The most probable explanation of this is, of course, the presence of a patulous ductus arteriosus, which allows the aortic blood pressure to act upon the pulmonary leaflets.

Dr. Edsall asquiesced in the view that it is impossible to make a definite diagnosis in most cases of congenital cardiac disease. The doubtful value of the different signs is often illustrated by the directly contrary views reached by different observers of the same case. Dr. Fussell's case had impressed Dr. Edsall as being most readily explained by the presence of congenital mitral disease. This would at once explain the accentuation of the pulmonary second sound and the marked right-sided enlargement. The only fact in the case not readily explained by this suggestion is the situation of the murmur; but it has been repeatedly demonstrated, especially in cases of congenital mitral disease, that a mitral murmur may be loudest at the upper part of the sternum—or, indeed, may be heard only in that situation, and not transmitted to the apex. Mitral disease would seem to be by all means the best explanation for the marked and rapidly increasing enlargement of the right heart.

Dr. Hand said that the difficulties in diagnosis during life are somewhat analogous to those sometimes encountered at the autopsy, in endeavoring to explain the physics of whatever condition is found. In the case referred to by Dr. Griffith, the lesion in which was a patulous foramen ovale, the right auricle was hypertrophied and dilated, the pulmonary artery was also dilated, the ductus arteriosus was obliterated, and the left ventricle and the aorta were hypoplastic. At first it seemed rather difficult to account for this condition of affairs, but the explanation finally considered the most likely is as follows: Supposing the left auricle to be filled with the normal volume of blood, there are two directions in which the current will flow; the greater part will go to the left ventricle; but a certain part (for illustration, one-fourth) will pass through the interauricular septum into the right auricle, which is at the same time moving the normal amount of blood to the right ventricle. The right heart, then, must dilate and hypertrophy, to receive and move a volume of blood greater by one-fourth than normal; consequently, the pulmonary artery becomes greater than normal. The infarcts that were present in the lungs were probably the result of an increase in this raised pressure, produced by some physiologic act, such as coughing or crying. The rapid respiration might have depended partly upon the infarcts or upon the raised pressure. As the left ventricle did not receive the full amount of blood from the left auricle, it became defective in the development of its chamber and muscle. With the aorta in a similar condition, the general circulation was not sufficient for the proper growth of the body; and a state of malnutrition resulted.

Dr. A. A. Eshner said that on the doctrine of probabilities alone, and particularly in the absence of evidence to the contrary, one would be led to believe that in cases such as that exhibited by Dr. Fussell and that reported by Dr. Hamill, the condition is one of deficiency of the interventricular septum. In the absence of a systolic murmur and in the presence of cyanosis, a deficiency of the interauricular septum is the more probable lesion. In some cases the deficiency involves the septum between both auricles and ventricles.

Dr. D. J. Milton Miller said that one must often be struck with the resistance to severe illness sometimes exhibited by these patients. He referred to a case in a woman of twenty-five, who had congenital heart disease with cyanosis and clubbing of the fingers, and who had passed through a severe attack of pneumonia with but little discomfort. The view that Dr. Fussell's case was due to congenital mitral disease appealed to Dr. Miller, particularly because of the marked and increasing enlargement of the right heart. He asked whether the mother of the patient had had rheumatism.

Dr. Fussell in closing said that he hesitated to make a diagnosis of the lesion in the case that he had presented. The difficulties are undoubtedly great. Those that may be met with the diagnosis of congenital heart disease were exemplified in some specimens that Dr. Fussell had shown the Philadelphia Pathological Society in 1888. In this instance, the subject was a child that had died at the age of two years. She had presented a loud double murmur, heard over the precordia and, to a less extent, over the entire chest. This child had passed through many attacks of enterocolitis and one typical attack of pneumonia. She ultimately died of cardiac failure. At the postmortem the heart was found to contain three cavities. The two auricles were united into one huge chamber. The right ventricle had received and distributed all the blood, both the aorta and the pulmonary artery being given off from this chamber. The left ventricle was hardly developed at all and had never been functionally active. Of course, the lesion in this case could not even have been guessed at during life.

Dr. Hamill, in closing the discussion, said that an extensive examination of literature had left him with the same impression that one usually gets after listening to a discussion concerning congenital heart disease. He had been driven to the conclusion that one may clinically get the evidences of any size or shape of the heart, and may find a murmur of almost any character, with any of the different congenital lesions. Dr. Edsall's suggestion had made him feel that it is quite possible that a mitral lesion had been present in his case. He had stated that the murmur had been heard in the position in which the murmur of pulmonary stenosis is most common; but the murmur was not of the character usually heard in pulmonary stenosis and, as he had stated, a presystolic murmur had appeared a few days before death. It seemed to him quite possible that, as is frequently the case in mitral stenosis, the murmur had been absent at first and had appeared only as the result of altered mechanical conditions.

Dr. Hamill said that he had reported the case chiefly because of the remarkable condition of the eye-grounds. The appearance of the vessels could best be indicated by quoting the remarks made by Dr. Posey when he examined them: That it is hard to see how they could be so much distended without bursting.

Dr. Arthur Van Harlingen read, for himself and Dr. Henry K. Dillard, Jr., a paper entitled: Notes on the Employment of Epicarin in Tinea Tonsurans and Tinea Circinata. Epicarin is said to be a condensation product of creotinic or creosotinic acid and naphtol, and to contain the properties of creosote and naphtol. It has been employed in a number of cases of ringworm of the scalp and body occurring in the Children's Hospital, and appears to have a decided value in ringworm of the scalp, its high penetrating power when in alcoholic solution being in its favor. In cases of ringworm of the body and of scatris in which the authors have tested its value, epicarin seemed to be too irritating for satisfactory use.

Dr. D. L. Edsall read a Preliminary Note on the Nature and Treatment of Recurrent Vomiting in Children. He referred to the fact that the nature of this condition has not been satisfactorily explained and that the treatment has been correspondingly ineffectual. He reported observations in six cases showing that a severe acid intoxication of the type seen in diabetes mellitus had been present in these cases; and that, except in one case, treatment directed toward this acid intoxication had had strikingly successful results. In this one case the result is still in doubt. The use of rapidly repeated, large doses of diffusible alkali was advised. The treatment should be instituted immediately upon the onset of an attack; or, better, as soon as any prodromes of an attack are observed. Dr. Edsall also made some remarks concerning cryptogenic acid intoxication.

Dr. Hand asked how long Dr. Edsall would advise that the use of the large doses of alkali should be continued. In a patient under rather frequent observation, Dr. Hand had had similar results, for a time, from the use of milk of magnesia, which had seemed to abort several attacks when given in dessertspoonful doses before the vomiting was well under way. Lately, however, it has been impossible to give this before the vomiting is in full blast; so he has resorted to copious draughts of salt water (normal salt solution), with the hope of avoiding the development of nephritis, a sister of this patient having died of hemorrhagic nephritis developing during an attack of cyclic vomiting. In this case, as in several others that the speaker has seen, the urine has shown, during the progress of the attack, albumin, cylindroids, red and white blood corpuscles, and renal epithelial cells and casts; in one case acetone has been present both in the urine and in the breath, as mentioned by Marfan. The father of one of these patients, himself a physician, called attention to the appearance of a deep purple band, on testing the urine for albumin by contact with nitric acid. Dr. Hand has been unable to determine to what this was due and whether it has any significance; but the father claims that the child does not begin to improve until this has appeared.

Dr. I. Valentine Levi asked whether these large doses of alkali have, of themselves, any tendency to cause gastric or intestinal disturbance.

Dr. Hamil said that our knowledge of the nature and treatment of nutritional diseases is so limited that any contribution to it is of importance. He mentioned a case of his own in which there had been repeated attacks of gastrointestinal disturbance, each lasting for a period of weeks. He saw the child only in the last attack, which had begun with general irritability and had persisted for a fortnight, with increasing depression of health. After this, there had been moderate vomiting; this was followed by general depression, and the child had become decidedly soporose. There was also a decided odor of acetone. The condition had seemed to Dr. Hamill to be distinctly toxic. Dr. Edsall had examined the urine, and had found large amounts of acetone, diacetic acid and oxybutyric acid present. Bicarbonate of soda was immediately given, in ten grain doses every hour. After ten of these doses had been administered the patient improved to an astonishing degree and seemed to be almost entirely well. The alkali was then continued in smaller doses, the urine being kept about neutral; and the acetone and diacetic acid rapidly disappeared.

Dr. Hamill asked Dr. Edsall whether he (Dr. Hamill) had not been right in stating that a specimen of urine from this case, examined after two drams of bicarbonate of soda had been given, was still acid. He also said that he believes it to be better to give the alkali frequently, in doses of moderate size, than to give it in an enormous dose at one time.

Dr. J. P. Grozier Griffith said that he welcomes any treatment that promises results in these cases. The cases are always extremely trying, and often dangerous. He has himself been unfortunate enough to see two cases die. He has not been able to convince himself that any treatment that has been used can be really depended upon, except to palliate the symptoms. Morphia hypodermically has given excellent results in some cases; in others, it has entirely failed. In one case, Dr. Griffith saw a continuous improvement and a final cessation of attacks under the use of phosphate of soda; and he now wonders whether this salt, which was used in large doses, could have acted chiefly through some alkaline property.

The presence of acetone in the urine in these cases had been repeatedly noted, even before Marfan's paper appeared. The meaning of this was, however, entirely obscure; indeed, it seemed doubtful whether it had any importance in relation to the nature of the condition. The explanation given by Dr. Edsall seems to Dr. Griffith to be a rational one; and he thinks that the effects of treatment are certainly promising.

Dr. D. J. M. Miller said that he agrees with Dr. Griffith as to the very unsatisfactory treatment of these cases; he also said that he believes the cases to be of a toxic nature. As an evidence of the latter, he related the case of a boy of eleven years, who all his life had had attacks of recurrent vomiting. Last February, he had a severe attack that lasted two weeks. Sometimes, after recovery, he was discovered to have a mitral murmur, which has persisted to this day. The attack was accompanied with fever. Somewhat corroborative of Dr. Edsall's views is the fact that Dr. Miller has seen a decided lessening of the frequency of the attacks brought about by the continuous administration of moderate doses of bicarbonate of soda, and by a diet from which the carbohydrates were largely excluded, in the intervals between the attacks.

Dr. Edsall, in reply to Dr. Levi, said that as far as he knows the use of large doses of alkali has caused gastrointestinal disturbance in only one instance—the case of Dr. Sharpless, which is the last one referred to in Dr. Edsall's paper. Dr. Sharpless believes that in this instance the doses used during the interval were too large; the child was receiving a dram three times a day. In the other cases no disturbance was produced by the alkali.

Dr. Edsall agrees with Dr. Hamill that moderate doses frequently repeated are decidedly better than an enormous dose given at one time. He said that he had not meant to indicate that he advises the use of two drams at one dose; he had intended to say that two drams, or about that amount, should be given in divided doses, very rapidly repeated.

As to Dr. Hand's question, Dr. Edsall stated that Dr. Pierson, who had had much experience in using this method of treatment, had written that he continues the use of large amounts of alkali until the symptoms have disappeared, the urine is free from acetone and diacetic acid, and the temperature shows no abnormal variations.

The use of milk of magnesia is not, in Dr. Edsall's opinion, a fair test of the effects of alkali in these cases; for the acidity of the gastrointestinal tract is not the important matter, if the theory of the presence of acid intoxication is correct. The element of importance is the excessive amount of acid in the tissues, and the only way to combat this is to use a soluble and readily diffusible alkali. Sodium bicarbonate is readily absorbed.

It is important, also, to use the alkali as early as possible; and particularly important to use it upon the first appearance of prodromes, should they appear in the case. After the stomach has once become violently upset, it is doubtful whether neutralizing the acids present in the system will satisfactorily control the symptoms. The matter of chief importance is, if possible, to prevent the onset of the attacks; although the alkali will apparently often abort the attacks, if given soon after the violent symptoms have appeared.

It is probable, however, that recurrent vomiting is not always due to the same cause, and that in a certain proportion of instances acid intoxication may be found absent; in such cases, flooding the tissues with alkali will be ineffective. It is, however, a comparatively simple matter to determine how frequently acid intoxication is present, and how often alkalies are successful in preventing or in aborting attacks.

Dr. I. Valentine Levi reported a case of cystitis due to the colon bacillus that occurred in a boy of fourteen. The infection took place through the boy's having used a syringe that had previously been used for administering enemata, in order to inject into his bladder. Two days later, the symptoms of acute cystitis appeared. A bacteriological examination of the urine showed a pure culture of colon bacteria. When put under treatment, the patient rapidly recovered.

Two other cases of cystitis in adults, in which pure cultures of the colon bacterium had been found, were reported; and the characteristics of this organism and of the infections produced by it were briefly discussed. The conclusions reached were: (1) That cystitis in which the primary bacterial factor is the colon bacterium is probably more common than is generally believed; (2) that the symptoms and the prognosis in cystitis due to this organism are more favorable than in cystitis due to pyogenic cocci.

BROOKLYN PEDIATRIC SOCIETY.

Regular Meeting, January 9, 1903.

President Wm. A. Northridge, Chairman.

Report of a Case of Post-Diphtheritic Paralysis.—Dr. Kerr: This case is interesting on account of the complications. A little girl, two years and six months old, was taken sick with what was called "cold in head and sore throat" on October 9, 1902. The symptoms of nasal and pharyngeal discharge were very decided at first. She was given a chloride of iron mixture. Dr. Howe, who was called in on October 15, found the child greatly prostrated. Pulse 143, irregular, changing rapidly with any amount of mucus in pharynx; temperature 103.2. Child restless change of position; respiration difficult, apparently from a large and distressed; had taken food and drink only under compulsion during preceding forty-eight hours. Toxemia marked; pharynx and naso-pharynx filled with thick grayish mucus, with white membrane extending from naso-pharynx into the pharynx. Diagnosis, diphtheria. Treatment 2,500 units antitoxin; stimulants. Twelve hours later, temperature 100.3 rectal. By noon the following day, temperature began to rise; all symptoms exaggerated. Another injection of 2,000 units was given. Stimulation had to be pushed with vigor. There was marked difficulty on swallowing, and all fluids were brought back through the nose. For the following five weeks there was a slow, but steady improvement. November 18th she sat up in bed, drank and ate moderately well, but there was still some paralysis, with occasional regurgitation of food through the nose, slight cough and decrease of mucus. November 22d Dr. Howe called and found that since November 18th the patient had absolutely refused all food, and that only by the use of force could anything be gotten into the stomach and that in the struggle much was lost. The force used caused the child to draw food into the trachea. Dr. Howe then used gavage, but the attempt was not satisfactory, food returning back along the outside of the tube. The child's condition was now poor. The abdomen was retracted, and there had been no movement from the bowel in seventy-three hours. Pulse 138, irregular; expectoration very profuse. Another attempt at forced feeding brought away by vomiting, a thick curd firmly formed, 5½ inches long and 1¼ in diameter. The patient was getting rapidly worse, and when seen in consultation with Dr. Howe and the father, on November 28th, we found the following condition: Pulse varying rapidly with slightest motion or excitement, from 126 to 145. Temperature 105. The quality of the pulse poor. Examination revealed an extensive bronchopneumonia. I advised the use of creosotal, increased stimulation, alternating rectal feeding and gavage and a pneumonia jacket. On November 29th the child grew suddenly worse, the respirations became very shallow and the trachea filled with secretion. The whole chest was then cupped. The gavage was stopped for a few hours and stimulants were pushed. Improvement from this time on was gradual but steady. For several days the respirations varied from 28 to 40, pulse from 112 to 150. The foci of infection in the lungs changed rapidly from one point to another, even when frequent examinations were made. January 9, 1903; it is still necessary to use gavage, but the paralysis is getting less each day; there is still inability to stand. There is present one small patch of consolidation on each lung, otherwise the condition is good. Slight murmur at cardiac apex. Child is violent in temper, even without provocation. In all other points there is a progressive gain.

Dr. Read: I should like to raise the question as to the value of cultures, as a means of determining that the case is not apt to affect others. I recall a patient where the bacilli persisted eight weeks after the case was clinically well. Child was isolated, until parents took the law into their own hands, and allowed the child out. In reference to treatment in this class of cases, there is nothing better than strychnine and general tonics.

Dr. Hutchinson: This case was an unusually severe one, and I believe that the initial injection should have been 4,000 to 5,000 units. The persistent mental conditions should receive care from where the fault lies, with the parents.

Dr. Bartley: We certainly ought to have some test applied as to the virulency of the bacilli. It is a matter of record that 15 per cent. of all healthy children by a culture show the presence of the bacilli in the secretions of the mouth, and this without any illness.

EDITORIAL

INFANCY AND TYPHOID FEVER

A recent symposium held before the New York Academy of Medicine on the subject of typhoid fever in infancy brought out a number of interesting features regarding this affection that only such collective expressions of opinion can do in problems of this type.

Only within recent years have pediatrists believed that children could have typhoid fever, it being almost the only affection that the text-books ruled out on the score of age alone. Now that it is clearly seen that children are but relatively immune the more interesting questions arise as to the causes of even this comparative infrequency. Breast-fed children, Elich taught, were supposed to obtain some immunizing substance from the mother's milk, but the incidence of recovered typhoids of mothers is too small, and again typhoid is apparently a disease that imparts a minor degree of immunity to future attacks, hence the mother's milk immunity theory is in need of revision or further extension. It is in the element of diminished opportunity for infection that a more rational interpretation is to be sought. Breast fed infants naturally have very slight opportunity for infection, and for the most part the food of artificially fed children is prepared under such conditions that would preclude the dangers of infection. It is quite certain that the prepared foods of the market have this in their favor that they are originally carefully sterilized. It is only by subsequent mismanagement that they can constitute any factor in the infection of babes.

From the New York experiences the diseases from which typhoid fever in infants is to be differentiated are pneumonia, nephritis and colitis. The pneumonias of low grade, particularly of the central variety, are particularly perplexing; minor forms of chronic nephritis, particularly in later stages of the disease and low grade in character, are at times difficult to diagnose and in certain varieties of colitis, insidious in their onset, mildly progressive, with abdominal tenderness and diarrhea, the differential diagnosis is well nigh impossible—they approach some of the paratyphoid infections.

The clinical course of the disease is well recognized to be very distinct from that seen in adults. The most classical and gradual rise in temperature is lacking and the intestines do not bear the brunt of the attack. The meninges and other nervous structures seem to be the parts most frequently affected. Skin eruptions, particularly many anomalous forms, are not uncommon, and many of the New York pediatrists pointed out that since the introduction of the newer synthetic antipyretics the number of anomalous skin eruptions had increased. This is particularly true for the antipyrine group and its related products.

The diagnosis is extremely difficult. Cultivation of the organism from the feces by the Hiss method is helpful, but the Widal reaction offers the best diagnostic aid; barring laboratory aid the diagnosis may at times be impossible.

SCHOOL AID FOR THE DEFECTIVES

The city of New York is finally making some progress in the matter of school care for its large army of defective children. A committee has been appointed by the President of the Board of Education, and steps are already planned looking towards the segregation of this portion of the school children.

It is to be hoped that special teachers, well instructed in the care of the defective classes, may be secured and that ultimately each and every school will have its specially graded curriculum for these unfortunates.

ABSTRACTS

Reflex Convulsions in Growing Boys and Girls.—Eustace Smith, M. D. (*The Lancet*, London, Jan. 24, 1903). The author questions the diagnosis of epilepsy in the case of convulsions of children after infancy, grounding his doubts on the fact that digestive disorders or other local disturbance will cause convulsions which cease on removal of the cause. He cites a number of cases and emphasizes the danger to the nervous system of any long continued irritation. The presence of that common symptom, habitual cold feet, may thwart the best efforts to treat a chronic complaint in children. Indirectly it affects the nutrition and tends to heighten the susceptibility to chills, thus aggravating any weakness or injurious tendency. It is probable that those cases in which attacks recur after treatment are really not cases of reflex convulsion, even at first, but the intellect is not affected, as a rule. In those cases in which convulsions are caused by indigestion a removal of the cause will be followed by complete cessation of the trouble, and with proper treatment health will be restored. Many cases have been observed by him which warrant his assertion that young persons who, as late as twelve years of age, have suffered from these seizures, may grow into perfect adults, showing no further symptoms of the weakness of their childhood.

Care of the Eyes of School Children.—Linn Emerson (*American Medicine*, Feb. 14, 1903). In introduction he enumerates the troubles that may possibly occur due to neglect of the eyes in school children and suggests an examination of each pupil as follows: (1) Does a child fail to read a majority of the letters on the XX. (20) line of the Snellen test types with either eye? (2) Do the eyes and head habitually grow weary and painful after study? (3) Are the lids or eyes habitually inflamed? (4) Is the child cross-eyed, or do these eyes diverge? If any of these conditions is present the parents should be notified.

Certain Principles and Methods in the Surgery of the Paralysis of Children.—The physician's neglect of orthopedic surgery is criticized by Dr. Robert Jones (London *Lancet*, Feb. 14, 1903). There is, he asserts, too great a tendency shown by the physicians, in England especially, to turn their patients over to instrument makers. The importance of working on the muscles, stretching and lengthening the flexors in acute infantile paralysis in addition to putting the extensors in such a position that their structural shortening will ensue, is emphasized by him; being careful not to confuse muscles which have been useless for years with muscles that are paralyzed completely. He notes, also, the manipulations of tendon transplantation and arthrodesis, in their relation to spinal paralysis. He advocates the use of the nearest efficient tendon, if it be strong enough, in preference to one from a greater distance, selecting, if possible, a re-enforcing muscle, the mass of which is parallel to the re-enforced. Splicing of the tendon, if done at all, should be done quite near where it is inserted to avoid a possible yielding of the paralyzed section. He has found that the best way is to transplant into the periosteum, if possible, by fixing the proximal part of the re-enforcing tendon into the paralyzed tendon, thus rendering it sufficiently tense to accomplish its end. In describing the operation of arthrodesis, he enumerates the advantages it presents in dealing with flail-like joints. Cerebral paralysis of the spastic type is next discussed, the idiot, microcephalic and the violent irritable type being classed among the incurable, success sooner or later following the treatment of all other conditions. In infantile hemiplegia, treatment of the hand and arm is not so hopeful as the diplegic cases, treatment proving futile if the spasm continues. The importance of flexing the elbow superficially, hyper-extending the wrist as the dominant deformities are pronation and carpal flexion, is particularly dwelt on by Jones, who follows the rule that the fixation of the spastic muscles in a position opposed to their contraction lessens the severity of their spasm, which is probably the explanation of the occurrence of good results. Tenotomy or tendon transplantation may be required later and every opportunity of performing tenotomy, in proper cases, should be seized. Operative, mechanical and educational treatment are involved in dealing with spastic paralysis, and if, after the expiration of twelve months, the surgeon is not satisfied with the results of his case, he had best let it alone.

Infantile Scurvy.—Among 179 consecutive cases of infants fed with pasteurized and sterilized milk observed by SILL (*Medical Record,* Dec. 27, 1902), 97 per cent. showed positive signs of rickets and scurvy, but in those cases supplemented by a breast feeding these signs were not so prominent. He does not favor sterilization or pasteurization of cow's milk for children, as he believes it is to the infant what canned or salt food is to the sailor. His idea is to study thoroughly the source and thus be enabled to exclude the possibility of disease.

Concerning Antipyresis in Children.—DR. E. W. SAUNDERS (*St. Louis Courier of Medicine,* Dec., 1902), thinks that, though the urgency of antipyresis is dependent on the concomitant symptoms instead of the height of the mercury, even in mild disease any increase in temperature should be carefully noted if suffering is caused. For relief hydrotherapy ranks first, but it will be found advantageous to combine the external and internal antipyretics at times. This method is too little practised. He does not object to the occasional use of coal-tar products if the fact that they are heart depressants be realized. The relief they afford in the beginning of scarlet fever and other exanthemata justifies their use, but they should not be employed in affections where the heart is liable to fail, such as in pneumonia and diphtheria. In influenza some cardiac stimulant should be added. He emphasizes the value of pilocarpine in scarlet fever and diphtheria, as an eliminant and antipyretic. Veratrum viride is the best antipyretic in pneumonia and is generally unduly neglected. He has found the external application of guaiacol of value in treating infants and children, for many pneumonia cases do not bear cold baths well. There need be no doubt about using it in typhoid fever and tuberculosis. If it is employed with judgment the danger of depression resulting is slight. In some cases one drop will be sufficient, while others will require several. Care should be exercised in the application of hydrotherapy. While some children take the full bath nicely, others become chilled and do not react promptly. The wet pack is most likely to agree for general use.

Bacillus Dysenteriae.—As it is too early to form conclusions with reference to Duval and Bassett's discovery, FISCH (*St. Louis Courier of Medicine*, Dec., 1902) believes that many intestinal affections of children are in some measure due to the bacillus. Zahorsky gives a number of rather puzzling instances of positive reactions, and the results of a few blood-tests of healthy infants gave invariably a negative result. He thinks that Duval and Bassett have cleared up a part of the question, but a number of etiologically different conditions are at present gathered under the head of summer complaint.

Summer Diarrhea.—DR. JOHN ZAHORSKY (*St. Louis Courier of Medicine*, Dec., 1902) as the result of a recent study of this complaint in the Bethesda Foundlings' Home obtained the *Bacillus dysenteriae* and found the Gruber-Widol reaction in a large proportion of cases. He believes that as undoubtedly the disorder depends upon the bacillus this must be considered the probable etiologic micro-organism, since other germs cannot be eliminated.

Calomel in Pediatrics.— In administering a laxative LADBIEWSKI (*Jahrbücher f. Kinderheilkunde*, No. lvi), prefers castor oil to calomel and enlarges on its almost marvelous action in flatulent colic, dyspepsia, febrile gastrointestinal catarrh, convulsions from indigestion, icterus, hydrops and syphilitic and scrofulous eye affections. He gives ten to twelve doses of calomel ophthalmicus in .005 to .02 gm. quantities, according to age, preferring this form of the drug as the finest pulverized. This preparation he advises made up fresh as traces of sublimate develop in the mixture of calomel and sugar also in time. Calomel decomposes on exposure to sunlight; and salt, salted foods and cherry laurel water, iodin and ammonium chlorid have a tendency to transform part of the calomel into sublimate.

The Medical Inspection of Schools.—In this article Dr. Somers (*Medical News*, New York, Jan. 24, 1903), reviews the work done in the cities of Chicago, Cleveland, Philadelphia and others in preventing epidemics through proper medical inspection; in ratifying existing evils; and in giving aid to children who are defective and others laboring under improper conditions.

BOOK REVIEWS

Diphtheria. By Wm. P. Northrup, M.D., of New York. Measles, Scarlet Fever, and German Measles. By Professor Dr. Th. von Jurgensen, Professor of Medicine in the University of Tübingen. Edited, with additions, by William P. Northrup, M.D., Professor of Pediatrics in the University and Bellevue Medical College, New York. Handsome octavo, 672 pages, illustrated, including 24 full-page plates, 3 of them in colors. Philadelphia and London: W. B. Saunders & Co., 1902. Cloth, $5.00 net; Half Morocco, $6.00 net.

This volume, the third in the series of English translations of the "Nothnagel System of Practical Medicine," needs no recommendation. Professor Jurgensen and Dr. Northrup are too well known for us to expect anything but the best. The article on diphtheria, entirely original with the editor, is fully in keeping with the high standard set by the other German articles which comprise the work. Dr. Northrup, having been associated with Dr. O'Dwyer at every step in the perfection of intubation tubes, is particularly fitted to describe this aspect of the treatment of diphtheria.

Professor Jurgensen's monograph on Measles unquestionably is the most comprehensive contribution on that infection that has appeared, bringing out so fully the valuable Danish records of the Faroe Islands epidemic. His exposition of Scarlatina is unrivaled both for richness of clinical detail and exactness and clearness of statement. "Fourth Disease" and German Measles have been accorded spaces consistent with their importance. The editor has shown judicious decision in his extensive additions, making the work far and away the best and most up-to-date treatise of the subjects extant. The book is profusely illustrated, containing, besides a large number of text cuts, twenty-four full-page plates, three of which are in colors.

PEDIATRICS

Vol. XV. MAY, 1903 No. 5

ORIGINAL ARTICLES

A CASE OF CONGENITAL HEART DISEASE WITH INTERESTING EYE FINDINGS

By Samuel McC. Hamill, M.D.

The title under which I present this case indicates my excuse for offering it here. I had hoped that I might be able to bring the patient, but unfortunately, he has died since my determination to show him, and, as it has been impossible to secure an autopsy, the clinical value of the communication is somewhat lessened. However, the history of the case is interesting; the photograph, which shows an unusual degree of clubbing of the fingers, and the report of the eye examination, which Dr. Posey kindly made for me, make the case well worth recording.

The patient, a boy aged nine years, was first seen in my service at the Howard Hospital on the 5th of January, 1903, when the following history was recorded: His birth was normal; he was not cyanosed when born. His family history is good. His previous history includes attacks of measles and pertussis.

The history of the present condition. He has been more or less blue since he was a few months old, and has always been dyspneic on exertion. For the past six months the dyspnea has been increasing. He has a "tight" cough and has had frequent severe epistaxis, followed by relief of all his symptoms. He has been in school for the past two years and has advanced well in his studies. He has been able to exercise in play until recently, but now he cannot walk even a short distance without extreme dyspnea. He sometimes complains of precordial pain and cardiac palpitation. He has no special discomfort on lying down. He has never been edematous. Latterly he has been much bluer than he was, and has had throbbing sensations in his head. He has never had convulsions nor syncopal attacks. He has had no defective vision; his hearing is good; he has some vertigo but no vomiting. His bowels are regular and his stools normal in appearance.

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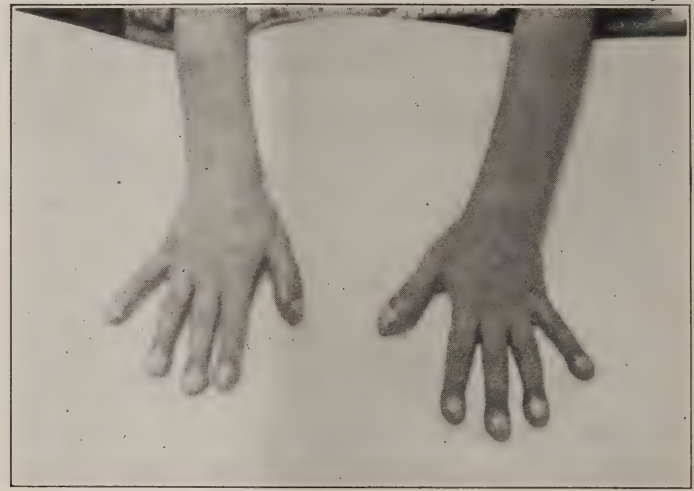
*Read before the Philadelphia Pediatric Society February 10, 1903.



Physical examination. He is of normal size for his age and well nourished. The skin of his face and body has a dusky bluish color; his lips and conjunctivæ and, in fact, all of his visible mucous membranes, have a deep purplish color. His hands and feet are especially congested and he shows extreme clubbing of the fingers and toes. His eyeballs are prominent, his anterior nares are bloody from recent hemorrhage. The skin of his body is covered with small punctate bluish follicles and is very rough and dry.

Examination of the heart. There is a visible impulse in the second, third, fourth and fifth left spaces, it being most marked in the fourth. The left chest is a little more prominent than the right. The impulse is best felt in the fourth space in the M. C. L. It can be palpated also in the fifth space and slightly in the sixth, three-quarters of an inch outside of the M. C. L. There is no thrill over any portion of the chest. The area of deep heart dulness begins above at the lower border of the first rib and extends three-quarters of an inch to the right of the right edge of the sternum and one and three-quarter inches outside of the left M. C. L. Auscultation shows at the apex a rather soft, short, blowing, early systolic murmur which accompanies the first part of a divided first sound. The murmur and the divided sound are both heard in the axilla, over the body of the heart and best in the third space to the left of the sternum. The murmur is heard faintly in the aortic area. The second pulmonic sound is much accentuated; the heart's action is fairly regular and rapid (120 per minute). The lung examination is entirely negative. The abdomen is moderately distended; the spleen is palpable at the margin of the ribs; the liver is palpable two fingers' breadth below the xiphoid and two fingers' breadth below the costal margin in the right M. C. L. There are marked pulsations in the veins of the neck and in the subclavians. Posterior to the sternocleidomastoid muscle on the left side, and almost directly underneath the mastoid process, there is a marked pulsation which on palpation feels like a tortuous and anomalously located external carotid artery. It is very superficial, distinctly pulsatory and expansile, and is about the size of a pigeon's egg.

The patient was seen three times after the above notes were made. On the occasion of the first and second visits nothing additional was noted. On the 17th of January the following notes were made:

He felt rather better yesterday than usual but slept very little last night. He coughed some during the night but did not complain on waking this morning. About 10 o'clock he had a spell of severe coughing in which he coughed liquid blood in large quantities; his nose began to bleed, and both the pulmonary and nasal bleeding have continued up to the present time (3 P. M.). His symptoms this afternoon are more severe than at any previous time. He complains of severe heart pain, and during his attacks of coughing he clutches his precordia. His dyspnea is increased greatly. On entering the Dispensary he coughed up several mouthfuls of blood. The cyanosis is much more marked and extreme. The lips and mucous membranes are a deep purple, almost black. His hands are unusually blue; the finger nails are almost as black as the mucous membranes. His respirations are rapid, shallow, and labored; there is marked supraclavicular and suprasternal inspiratory retraction and the alae of the nose play. There is extreme pulsation in the veins of the neck and subclavians. The liver cannot be seen to palpate. The area of heart dulness to the right has increased almost to the right M. C. L., and the left border extends to the anterior axillary line. Auscultation shows the heart's action much more rapid. In the region of the nipple there is heard a rumbling murmur which seems pre-systolic in time. The first sound has become sharp and shorter and higher pitched. Near the third left costal cartilage there is a murmur which has a much more superficial sound and is systolic in time. It is also heard in the first and second left spaces. These two murmurs are heard to some extent over the entire body of the heart and are transmitted faintly to the axilla. There is no thrill palpable. There are distinct systolic and diastolic shocks, palpable over the apex, and to some extent along the left edge of the sternum. There is a diastolic shock over the right side of the heart as far out as the area of dulness. There is no pulsation of the liver. There is no further enlargement of the spleen. Examination of the lung shows nothing aside from a very feeble respiratory murmur over the entire chest. There are no rales and no suggestion of bronchial breathing and no areas of marked impairment of the resonance, the resonance over the whole chest, however, being less than the average normal. A partial examination of the urine made at this time showed a specific gravity of 1008 and a trace of albumin. The temperature, taken in the mouth, was 104° F.

The patient died at his home two days after the above notes were made. An autopsy was not permitted. The result of the eye examination made ten days before death by Dr. William Campbell Posey was as follows:

"The eyeballs are prominent. The conjunctival vessels, both those of the globe and those of the lids, are swollen, especially the veins, giving the eye a dark purplish appearance. The pupils are large and the media clear.

"The findings of the ophthalmoscope were very striking, and consisted in a neuroretinitis of marked degree. The retinal arteries and veins were greatly swollen and tortuous, resembling large angle worms. The head of the optic nerve was obscured by the swollen retina and there were a few small hemorrhages into the nerve fiber layer of the retina close to the disc. The light reflex from the vessels was greatly broadened, that of the veins the more so. I do not remember ever to have seen retinal vessels of a larger caliber, the retinal veins appearing to be increased to three times their normal size."

This remarkable condition, to my mind, is dependent upon the extreme degree of cyanosis from which this patient suffered. Curiously enough, the study of the eye-ground seems to have been given very little consideration in the general study of these cases. The ordinary textbooks make no reference to it, and the special works relating to the congenital diseases of the heart pass it over with very little comment. A few cases have been recorded, but I am told by Dr. Posey that the number of cases in the ophthalmologic literature is exceedingly small.

I happened to notice a case reported by George Carpenter, the patient being a boy seven and a half years old, and having extreme cyanosis, which is so similar to the case recorded that I wish to read his description. He says: "His eyes, which were examined ophthalmoscopically shortly after death, showed the retinal veins to be very large, the arteries of good size, and both sets of vessels most intensely cork-screwy. There was no edge to the optic disc, and the red reflex apparently started from the physiological pit." He refers to another case in which the ophthalmoscopic findings were the same.

I have refrained from commenting upon the diagnosis of the specific lesion in this case, for the reason that I have been unable to reach any satisfactory conclusions regarding it. My feeling after the first examination, based upon the greater frequency of this lesion, the extreme cyanosis, the age of the patient and the location of the murmur (in the third left interspace), was that the case was one of stenosis of the pulmonary artery, with patulous ductus arteriosis, the latter accounting for the marked accentuation of the pulmonic second sound. The absence of the thrill and the frequent association of deficiency of the interventricular septum with pulmonary stenosis led me to consider the possibility of this combination. When, on the occasion of the last visit, at a time when the heart was acting much more violently than at any previous time, there appeared in conjunction with the systolic murmur a distinct presystolic murmur, with an alteration in the character of the first sound, my theories as to diagnosis were somewhat altered. Had this presystolic murmur existed from the first I might have been inclined to believe that there existed as a part of the lesion an obstruction at the mitral orifice. This, however, is purely speculative. There are not sufficient data upon which to base a definite opinion.

EPIDEMIC PAROTITIS WITH METASTASIS TO THE FEMALE GENITALIA; WITH A REPORT OF A CASE

By George McNaughton, M.D.,

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Mumps may be defined as an infectious disease, characterized by inflammation of the parotid gland. The nature of the virus producing this disease is unknown. It is met most frequently in childhood and adolescence. Very young infants and adults are seldom affected. It is more common among males than females. The period of incubation is from two to three weeks, symptoms being usually absent during this stage. The parotid gland and sometimes the sub-maxillary swell, the surrounding tissues become tense, and consequently somewhat painful. This condition persists for about ten days or less, then gradually subsides and the patient rapidly regains his health. As has been stated, the microorganism of this disease has not been determined, yet it is supposed that it enters through the excretory duct.

In the adolescent male, orchitis on one or both sides may develop directly as the parotitis subsides, or it may occur ten days or two weeks later. This complication, if it may be so called, is rare before puberty, and is also rare in the thoroughly matured man. The proportion of cases of orchitis varies in different epidemics. The orchitis sometimes develops before the parotitis, and it may be the only manifestation of the infection. In one epidemic reported by Comby, there were 699 cases. Of that number there were 211 cases of orchitis, and it is interesting to note that 103 instances of atrophy followed 163 cases of orchitis.

Read at a meeting of the Brooklyn Gynecological Society, December 5, 1902.

Symptomatic parotitis may occur in the course of infectious fevers, as typhus, typhoid, pneumonia, pyemia, etc. This form of inflammation of the parotid sometimes occurs in connection with injury or disease of the abdomen or pelvis. Of 101 cases of this kind reported by Stephen Paget 10 followed injury or disease of the urinary tract, 18 were due to injury or disease of the alimentary canal, 23 were due to injury or disease of the abdominal wall, the peritoneum or the pelvic cellular tissue. The remaining 50 were due to injury, disease or temporary derangement of the genital organs. By temporary derangement is meant slight injuries or natural processes, as slight blow on the testes, introduction of pessary, menstruation or pregnancy. Most practitioners have observed examples of orchitis accompanying or following epidemic parotitis. Some have seen it occur as a symptomatic parotitis, and nearly all have been interested in the subject from a pathologic standpoint. No satisfactory explanation has been offered. Most of the textbooks refer to the ovaries and breasts of the female as being involved at times. Yet careful search has failed to find but few instances.

In the *British Medical Journal* of June 20, 1891, appears a letter from John Benjamin Hilleu, Lecturer on the Diseases of Women and Children, Yorkshire College, Victoria University, in which he says: "There is a great dearth in recent literature of instances of metastasis in the female breast, ovary, vulva or uterus, and any practitioner who should record a case of metastasis to any of these structures, arising from mumps, would furnish material of great interest and value, especially in regard to the last three, namely, the ovary, vulva and uterus."

In *Magazin für die gesammte Heilkunde,* band 15, Berlin, 1825. "Medical Observations," Dr. Anton Fred. Fisher, of Dresden, reports the "case of a girl of seventeen who had an attack of acute rheumatism complicated with double swelling of the parotids. The fever and all except the parotoid swelling subsided in a few days. She was allowed to get out of bed, and a little later to go out. Eight days later she had a chill and fever, with a sharp pain over the left ovary. In spite of antiphlogistic treatment the ovary remained swollen and tender. The pain was of a boring and sticking character, which continued until a glairy mucus started from the mouth of the uterus."

In the *Stethoscope and Virginia Medical Gazette* for June, 1851, A. Snead, of Richmond, Va., reports a case of metastasis of mumps to the brain and uterus. The report is as follows: "On the eighth day after swelling of the right parotid, the left becoming involved three days later. When seen the patient's head was intensely hot, temporal arteries beating violently, patient somewhat delirious, occasional vomiting. At this time a bloody flow from the vagina occurred which was ten days before her regular time, which heretofore had always been regular and at which time she suffered no pain. Now there was a very smart pain in the region of the womb, and the discharge was greater than normal. Pressure over the hypogastric region caused considerable pain. The mammæ were not affected."

A case of abortion was reported by Thomas Salter in the *London Medical Gazette,* 1849, page 106, under the title "Abortion Produced By Metastasis in Cynanche Parotitis." Abortion at three months occurred during the first week of the disease. No tendencies in previous or subsequent pregnancies to abort.

Dr. Charles W. Risk, of Quincy, Ill., reports a personal case in the *Gaillard Medical Journal,* October, 1894, of parotids with metastasis in a pregnant uterus which resulted in a miscarriage at three months, and he also refers to a case of Dr. F. D. Halcom, which was reported in the *Journal of the American Medical Association,* May 14, 1884. This patient was delivered of a dead child at seven months, the patient herself being delirious and dying two days later.

Le Progrès Médical, Paris, Feb. 11, 1893, "Localization of Mumps in the Sexual Organs and Their Adnexæ," by Dr. Comby. After considering the metastasis of mumps to the testicles, he takes up the consideration of the complications in the female sexual organs. He considers ovarian complications very rare, and proceeds to give the literature as far as he knows it. His first citation is from Trousseau, who discovered a metastasis of mumps in the mammary glands and was astonished that the ovaries were not affected in the same way. He cites Bizet, who saw two females, aged 29 and 32 years, with severe pain in the region of the ovaries, preceding the swelling of the parotid glands. Quoting from Niemeyer, who had observed pain which was aggravated by pressure over one or both ovaries, led him to suspect that the female organs did not become affected the same as the testicles. Citing another case from Meynet of a girl aged 16, menstruation irregular, who had double mumps, swelling of the parotids subsided in eight days, but the fever continued high. A severe pain began a little below the right of the base of the right iliac fossa, and a tumefaction could be made out over the right ovary. At the end of three weeks swelling of the parotids reappeared and that of the ovaries subsided. Citing from Peter, a girl at the beginning of a regular menstruation was attacked with mumps. Instead of the flow coming on, the parotids swelled and a thrombus of the labia major and minor occurred. Still another case is Boutillier's, of a girl aged six, double mumps with pain in the iliac region, finally localized over the right ovary. A tumor corresponding to the ovary was made out. It was fusiform transversely, movable and painful. Recovered in two weeks.

After reiterating that ovarian complication of mumps is a rare condition, he states that this ovarian inflammation is apt to produce atrophy and sterility.

In *Review Médicale de la Suisse Romande,* third year, No. 2, page 81, 1883, Dr. V. Gautier reports a case of a woman who while in the childbed contracted mumps from a child eight years old. There were no mammary or ovarian complications, parturition and mumps both ran a normal course.

L'Union Médicale, Oct., 1894, Transactions of the Academy et Societie Savants, Paris, reporters' names not given. After describing three or four epidemics of mumps, some of the cases being complicated with orchitis, the reporter speaks of the ovarian complication of mumps. In introducing this part of the subject he says that Bizet and Le Marchand observed swelling of the male mammary glands with a discharge of fluid on pressure. While this is a rare condition it is still more so in the female, and swelling of the ovary he considers still rarer. He then mentions the following cases, but does not give any description:

Fernel's three cases reported in 1812, one by Jobard and one each by Biznet, Meynet and Boûteillier. Also Peter's and Comby's cases (see abstract from *Le Progrès Médical,* Feb., 1893). He considers Comby's case one of anomalous ovulation.

Laglais, Rilliet and d'Heilly have reported cases similar to

Peter's. D'Heilly reports a case of mumps complicated with metorrhagia. He states that other authors have observed mumps affecting the female sexual organs, but that they have not sufficient data to prove their cases.

Trans. of the Soc. of Medical Sciences of Lyons, 1867. Dr. P. Meynet reports a case in a girl sixteen years of age. She was lymphatic and nervous and had lived all her life in a malarial locality. Was attacked with mumps of the right parotid, and a few days later the left became involved. On the sixth day of the disease she complained of discomfort in the right iliac fossa, a slight swelling could be made out over the right ovary. Nothing was noticed on the left side. On the eleventh day of the disease there were pain and swelling of the left ovary. The ovarian complication remained for three weeks; during this time the parotid swelling and tenderness subsided, but returned when the ovarian tumor disappeared. He questions if the ovarian complication is a metastasis, and adds that if it is, it is a rare complication. He quotes a case reported by Gubian of a girl with irregular menstruation who had, following double mumps, a tumefaction of the ovaries. He says that swelling of the labia is not an uncommon complication of mumps.

Hospital Reports, Hotel Dieu, Service of Fournier, *Journal de Medicin et de Chirurg.*, 1 Pratiques, 1867, tome 38.

Female, aged 34. Fever, headache and night sweats for eight days, followed by a swelling of the left parotid. The next day the right gland was involved. When the granular swelling subsided the labia became enormously swollen.

"Graduation Thesis, 1888. A Contribution to the study of the Fever of Mumps." By Dr. Benj. Bourgeois.

After a number of pages given to the general consideration of the disease, he turns to the complications: That of the mammary gland has been observed. Fernel, in a thesis, Strasbourg, 1812, was the first to call attention to this complication and reports a number of cases. In a thesis, 1875, Joubard (Paris) reports another. Of ovarian complications he says that very few cases have been observed, and those that have been are of doubtful authenticity. He quotes the case of Meynet and Bouteillier, and a new one seen by Moutard-Martin. The author attempts to explain why so few cases have been observed by the fact of the difficulty in diagnosing the complication. He does not attempt to advance any theory of how the various organs become affected, except by metastasis. He remarks that it would be interesting to note if the woman with ovarian mumps became sterile as men often do. He states that the tumefaction and inflammation of the labia have been observed a number of times and quotes Rilliet, Fournier and Gailhard as authority.

"On the Occurrence of Affection of the Ovaries Accompanying Epidemic Periparotitis of Very Young Girls." By Docent Troitsky, *Russki Vratch*, Vol. I., No. XV., April 6, 1902. During last year I had occasion to observe a series of cases of epidemic periparotitis complicated with affection of the genitalia. The young patients were under the direct observation of Dr. Geouk, who gave me the opportunity to take part in their examination. The epidemic began the first of February, and lasted until the 7th of March, or 35 days. The number of patients was 33. Their ages were as follows: Two were nine years of age, two were 10, two were 11, ten were 12 years of age, seven were 13, the same number 14, and three were 15 years of age. The average duration of the disease was 15.7 days. (Maximum 26, minimum seven.) From one to two weeks the disease lasted in 21 cases, and from three to three and one-half weeks in 12 cases. In the first three days of February there were 24 cases. Thirteen out of all the girls menstruated, the rest did not. Double-sided inflammation of the glands was observed in 27 cases, or one side in six cases."

The chief interest of this epidemic lies in the fact that in many cases the disease was complicated by disease of the ovaries.

The latter could be demonstrated by tenderness in the region of the sexual organs, the examination being made by pressure on the abdominal wall. It is true that such a method of examination leaves room for many objections, but it was the only admissible one. The presence of tenderness over the anatomical place of the ovaries was a very typical one. Of all the 33 cases the ovaries were affected in 13. Eight of them had already had their menstruation, the rest had not. When the parotid gland was affected on both sides, both ovaries were diseased, when the disease of the parotid gland was only on one side, the ovary of the same side was affected. The tenderness of the ovaries lasted in most cases, as the observations of Dr. Geouk showed, longer than the inflammation in the region of the parotid gland. There was one case where the latter inflammation lasted 26 days, and the tenderness of the ovaries only 10 days.

The clinical course of the disease was the usual one, the temperature ranging between 38.5° to 39° C. and only in one case it reached 40 C. There never was any abscess formation.

On reviewing the literature on the question, I frequently found mentioned different disturbances of menstruation following the disease. I requested Dr. Geouk to get information in that direction from the patient a year after the disease was over. All the information was negative. The mammary glands were never affected.

Before I proceed with the review of the discussion of the opinions of recent writers, I wish to quote a chapter from my dissertation on this subject written in 1883, "Localization of the Disease in the Region of the Ovaries in Epidemic Periparotitis." "It is rather rare in comparison with the similar complication of the genitalia of boys. This should seem rather unexpected, taking into consideration the similarity of the function of the ovaries and testicles. Gynecologists do not mention the subject at all, and Grisolle, in his work on internal pathology, states that the mentioned complication of the disease is not at all demonstrated. The chief difficulty in gaining more knowledge on the question lies in the difficulty of making a thorough examination, as most of the patients are young girls. Why not admit that the complication occurs more frequently than it is observed and that it has a milder course than the similar complication of the testicles?" Further, "the nature of the process is absolutely unknown, but this gives us no right to ignore the cases described by different authors. The general symptoms are various, as loss of appetite, fever, sleeplessness, in some cases slight indigestion without any fever, and finally, they are totally absent. In the latter case only the local symptoms are observed, and are as follows: pain in the lower part of the abdomen; on palpation there is generally found a tumor of a size larger than the usual ovary. The tumor is very tender and movable. The local symptoms gradually disappear." Only in one case, in 1853, Meisnhardt observed a girl of 16 years who had suffered from a double-sided proparotitis. In the course of the disease an abscess was formed in the region of the left ovary. The abscess was opened and recovery followed. Meinhardt regarded the complication as a purulent perioöphoritis.

In the article of O. Leichtenstern on the inflammation of the ovaries during mumps, he gives mention only to the cases of Meynet and Bouteillier (cited). Hyperemia and inflammation of the ovaries are seldom observed on patients with mumps, according to Hennig. The well described cases belong to late infantile age, though it is possible that they will be demonstrated also in young girls. A case is described by Dr. Peter from the wards of Trousseau, where a girl with mumps got a severe inflammation of the ovaries with a temperature of 40° C. The tumor of the parotid region at the same time diminished in size. Quoting the data of Lebedinsky in regard to the frequency of parenchymatous inflammation of the external layer of the ovaries with the following loss of its normal function, Henning at the same time throws a doubt on the possibility of the same complication during epidemic periparotitis. In the text-book of E. Bauchut cases are mentioned when repeated inflammation in the parotid region was accompanied by inflammation of the ovaries. Cadet de Gassicourt denies the possibility of the ovaries being affected during this disease, though admitting such a possibility for the other female genitalia.

It is impossible to agree with the argument of P. Mercier, who denies any complications in the female genitalia for the reason that Cadet de Gassicourt, A. Baginsky and E. Henoch have not had any personal observation corroborating such a possibility. There were other authorities of equal reputation that had observed this complication. Finally, not in every epidemic of the disease do the ovaries get affected, or do so in a very slight degree, so that it can be detected only on a very thorough examination. Further, it must be remarked that the described complication occurs most frequently in young girls who conceal the pain in order to avoid an examination. Besides, mumps are regarded as a very harmless disease, where the help of the physician is unnecessary and which gives rise to no serious complications. B. Donkin, a follower of P. Mercier, goes so far as to call the localization in the region of the ovaries very problematical.

In the classical text-book of Bartlez and A. Saune, one reads that the ovaries are not as frequently affected as the testicles of boys having mumps.

Oliver Rex, in his monograph, mentions that girls suffering from mumps may get the ovaries affected; however, the inflammation of the latter organs is not a serious matter and passes in the same manner as that of the parotid glands. When the complication is over, the disease of the original organ may be aggravated.

Recurrence of the complication in the early school age is beyond doubt. I. Comby and A. Monti quote a case of Voegt, where a girl, 11 years of age, on the third or fourth day of the disease got an acute pain in the region of the right ovary. On examination a movable, painful tumor was observed above Poupart's ligament. The tumor lasted five days. The first of these writers ascribes importance to the localization of the tumor, while the latter denies its importance, adding that the tumor beginning on one side, develops also on the other side. This is noteworthy, as the course of the parotid swellings may be similar. Weill reports the case of a girl 10 years old. A slight tumor and pain developed in the region of the ovaries. E. Holt admits the possibility of the occurrence of the complication only in rare cases, and states that it is more possible in very young girls.

How different are the views of authors on this complication can be seen from the following: Le Gendre and A. Broca consider it so grave that they advocate complete rest in bed and ice on the region of the ovaries during the complication, while Tuttle declares that the complication passes without any ill effects.

Summing up the literature on the question the following conclusions may be drawn: The localization of the disease in the region of the ovaries is in mumps more frequent than it is mentioned in literature.

The fact that the complication is observed less frequently in girls than the similar complications in boys, may be due to the fact that female genitalia are less accessible to examination. General symptoms may be absent during the complication, and when present it is hard to analyze whether they belong to the original disease or the complication. It has to be remarked that local pains in the region of the ovaries occur most frequently at the height of the disease.

This observation on the alternating localization of the disease in the region of the parotid gland and in that of the ovaries, demonstrates a certain relationship between these two organs.

The anatomical nature of the disease is not yet known. By analogy, it may be admitted that there takes place either an inflammatory process of the outer layer of the gland, or singly, a paroöparitis. More serious changes may be admitted, like those that develop in the testicles, and that ultimately cause the atrophy of the latter glands.

The age when the disease complication is most frequent is ten years, but may occur also in younger girls. It is of course a question whether the complication is very serious, or passes without any ill effect. The former seems more probable, though one would not wish to apply tincture of iodine or vesicants for the treatment of it. It is, however, absolutely necessary to keep the patient in bed for several weeks, having bandaged the abdomen and taking care of the regular function of the intestines.

Acting in this manner one may be more certain to avert any ill effects from following the disease.

I respectfully submit the following history: E. Q., now in her eighteenth year, began to menstruate at fourteen, always regular and always painful, pains commencing with the flow and continuing 12 hours after it was established. Several of her acquaintances suffered from parotitis. In her case parotitis occurred on both sides, well marked, on May 17. Two days previously, there was some difficulty in moving the lower jaw. She had suffered some malaise during the previous week.

Her last menstruation commenced on May 6, which was at the proper time, and her suffering was as usual. On the 22d of May as the parotitis began to subside, the patient suffered pain in both ovarian regions, which was increased in severity for two days, when a bloody flow appeared. The pain was severe enough to require the continued use of an opiate for five days, the temperature during the intensity of the trouble reaching 104° F. There was no swelling or particular tenderness of the breasts.

The next menstrual period occurred about six weeks subsequent to May 22. Since that date the menstruation has been regular and without pains. It is proper to state that the patient in the meantime had made a sea trip to Europe, which in itself might have delayed menstruation. The foregoing brief history

I believe to be an illustration of the specific poison of parotitis affecting the female genitalia. I do not say ovaries, because I do not belive that it is possible to exclude other pelvic inflammation or engorgements and as there has been no opportunity for autopsy in cases of this kind, it is not yet definitely known that the ovaries are affected alone, and we can only consider such manifestations as may be apparent. As in the case related, we know that there are inflammatory conditions of the pelvic organs. But it was impossible to define an oöphoritis, salpingitis, metritis, or an endometritis; therefore the title of this paper. The use of the word "metastasis" may be questioned, although mumps have long been the dictionary illustration of that phenomenon. Pathologists question it and all fail to describe a satisfactory anatomical route of the pathogenic organism.

It is not reasonable to suppose that the microorganism of parotitis selects the parotid gland by preference, but may attack other glands or structures as another choice. The predilection being the parotid glands, then the sub-maxillary, the testicles in the male, the mammæ in the female, the male breast, and finally and last the female genitalia. The order mentioned may not be strictly correct, but it is as it appears to me at this time. Parotid gland extracts have been used in the treatment of ovarian disease. It was used first by Dr. Robert Bell, of Glasgow, Dr. John B. Shober, of Philadelphia, and Dr. E. Pierre Mallet, of New York. This paper is not intended to consider that phase of the subject. I shall only refer to the reason given for the use of the parotid extract, which was "the physiological relation shown between the parotid gland and the ovaries as seen by frequent metastasis between the two." A close inspection of the literature on the subject will show that it is a rare occurrence, unless the observations of Troitsky are indorsed in subsequent epidemics, in which case the matter is one of great importance.

MASTURBATION IN THE YOUNG GIRL A CAUSE OF ACQUIRED SEXUAL PERVERSION

By William Lee Howard, M.D.,
OF BALTIMORE, M. D.

To the specialist in functional neuroses is revealed the true personality, the real ego, of the individual. Few surgeons or general practitioners realize what a great role auto-erotic phenomena play in the development of the young girl, or the influence it has on her future. I have no desire to be considered as giving expression to the idea that every young girl has auto-erotic periods, or that in many girls excessive eroticism is the cause of those puzzling and baffling conditions met with in general practice, and put down in the casebook and treated as hysteria. What loopholes that word hysteria offers to the physician! The idea I wish to convey is that the psychic side of life, and the basis of life—sexual activity—is not sufficiently understood or studied by the physician. Too many seem afraid to admit the passional element in humanity, or are blind to its tremendous ethical significance. The man who attempts to get at the cause of his patient's anemia by blood count and examination, by all the objective signs his laboratory and clinical experience has taught him, generally discovers what he is after, but not always. It does not always occur to him that the young patient has at this period a very active psychic side of life as well as a physiologic one. The girl may be, and generally is, innocent of the cause of her trouble, but not ignorant of teasing, wakeful auto-erotic phenomena which have disturbed her normal physiological rhythms.

In normal persons there are great variations in the age of experiencing voluptuous sensations before puberty. Masturbation has not up to this period been practiced, but unless the case is understood—and this comprehension must be accomplished without giving any suggestive ideas or questions—the habit will soon be formed. It is these cases which develop into nymphomania and sexual perversion.

The following case is an example of the insidious and baneful effect of early masturbation following the auto-erotic day dreams of a young girl.

Mrs. M., aged forty-four. She was sent to me by Dr. Morrison. It took several days to get a satisfactory history of the woman, as she had heretofore been obliged only to answer the few stereotyped questions put to her by various physicians. Before giving an account of her childhood life her present condition must be explained. She married when twenty-four years of age a business man five years her senior. They lived together five years when her husband left her and went abroad to live. The reason he left was on account of his wife preferring self-masturbation to normal intercourse. When her husband did have sexual relations with her she experienced no psychic or physiologic organism, but would compel him after the act to leave the room while she satisfied herself by masturbation.

Her present condition is as follows: Physically she is large, fat and flabby; neurotic in her conversation and actions. Lives alone, although financially able to keep a household of servants. Still menstruates, and there are no subjective signs of approaching menopause. The impulse to masturbate has undergone considerable change from its earlier origin. This woman will pass a man on the street in the evening—she seldom goes out during the day—and touching him with her hand or elbow, will immediately have an uncontrollable impulse to masturbate, which impulse she will at once gratify by rushing up an alley or into the closet of the first house, or even saloon, to which she can obtain access. If she has this impulse in the theater she rushes to the toilet room. So uncontrollable has this morbid desire become that she has often masturbated under the sheltering shades of a street corner, or any place offering the slightest idea of temporary seclusion.

This woman was born in New England of the class of puritanical parents whose sole idea of bringing up their children appears to be the one of ignoring everything connected with the physiology and hygiene of life. Such children are left to the instruction of other wiser but less innocent children, and soon become the ignorant victims of sexual neuropaths and perverts. Having had no instruction or advice in sexual matters, these children easily become the placid scholars and imitators of the sly and insinuating erotopath. As I have in my work on this subject gone deeply into this vitally important matter, it is unnecessary here to further comment.*

At eleven years of age our subject was sent to a boarding school some distance from her Vermont home. On her journey to the school the train became snowbound, and as night approached the passengers were informed that they would have to remain over night in the small town where the train was stalled. The young girl's embarrassment and fear was noticed by a woman passenger, who apparently took a motherly interest in the child. The rest of the story is soon told. That night the weak, undeveloped sexual cells of the cortex were awakened, directed in the wrong channel, and a child masturbator, with psychic imaginings and fancies of women constantly arising, was the result. These inverted pictures kept up until the woman reached the age of about thirty, when the conditions now present gradually made their appearance.

In this case we have an undoubted case of inversion through acquirement. There are none of the signs, objective or subjective, of the congenital invert. Properly taught in early childhood of the significance of sexual activity and its normal relation to health, this unfortunate girl would have become a happy wife and devoted mother.

Where was the family physician when it was decided to send this little girl among strangers? A full knowledge of the moral sin he had committed when he ignored the most important advice he should have given mother and father, would be a just punishment for him.

No man whose moral standards are primarily conventional can understand the power of certain impulses; nor can the man whose perceptions of moral values is uncertain or blurred, estimate the fearful responsibility in treating children of psychopathic or erotopathic tendencies. A clear moral, as well as a worldly and physiologic insight, are the necessary requisites for the physician who expects success among those exhibiting excessive normal and morbid impulses.

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*"The Perverts," G. W. Dillingham Company.

RAW COWS' MILK IN INFANT FEEDING

By Elias H. Bartley, M.D.

The history of the general consensus of opinion as to the best methods of artificial feeding of infants, reveals more rapid changes during the past few years than in any other branch of medical practice. These changes have been brought about by a better understanding as to the composition of human milk and of cows' milk, and of the better knowledge of the bacteriology of milk and of the intestinal canal, as well as of a more thorough appreciation of the principles of feeding and nutrition. The first real impetus to the scientific feeding of infants, based upon the chemical modification of cows' milk, was given by Biedert's recommendation of mixtures of cream milk, sweetened, and made alkaline with lime water.

Meigs in 1882 first worked out a formula that he believed corresponded with the analysis of human milk. He called attention to the low percentage of proteids in human milk, and the necessity of reducing the proteids in mixtures for artificial feeding.

Rotch in 1889 recommended Meig's mixture, but advised reducing the lime water.

Soxhlet in 1886 proposed (*Münch. med. Wochenschr.*, April, 1886) sterilization of cows' milk by heat as the best safeguard against the intestinal disorders of bottle-fed infants. For a time sterilization, either with or without previous modification on the lines developed by Meigs, became very general. Shortly after this I induced one of the milk companies of this city to put upon the market ready-made Meigs' mixture. After one summer's experience with this mixture I found that it was decidedly deficient in nutritive constituents. Out of about a dozen infants fed upon it, not one maintained normal nutrition, and most of them developed rachitic symptoms. A careful study of the milk in the laboratory showed that when the casein was coagulated either by rennet or by acid the albumin was precipitated with it, thus increasing the curd precipitated in the stomach. It was observed that the infants fed upon sterilized milk, as well as upon the cream mixtures, lost a large part of the proteids in the stools. Owing to these defects, noted by many observers, a reaction occurred, and loth to abandon the beneficial effects of cooked milk, pasteurization was very generally adopted. This consists in heating the milk to a temperature just short of the coagulating point of lactalbumin, which is 158° F. While this was a distinct gain over sterilization at 212° F., there undoubtedly occur changes in the milk, not easy to understand, but which are evident to close observers of children fed upon such food. No fact in the etiology of rickets and scorbutus is better established than that they are developed during the prolonged use of cooked foods.

In 1898 the American Pediatric Society made a collective investigation of scorbutus with the following results relative to the diet:

Of 379 cases reported, breast milk was the only food in 10. Raw cows' milk in 4; pasteurized milk in 16; sterilized milk in 68; condensed milk in 32; proprietary infant foods in 214. These figures emphasize the difference between raw and heated milk, as an etiological factor in the production of this disease, although it is not certain that this is the only factor. It is somewhat surprising that ten of these cases were fed exclusively at the breast, and only four on raw cows' milk. It is probable, however, that the number of infants fed on raw cows' milk is much less than those fed at the breast, or than those fed on condensed or sterilized milk. This fact will explain, in part, the surprising fact that of the cases collected, more than twice as many occurred in breast-fed infants as in those fed on raw cows' milk.

The general results of this investigation are in accord with the experience of numerous individual observers. The consensus of opinion is that pasteurization and sterilization are harmful to the nutritive qualities of cows' milk.

It is probably not due to the changes in any one or two constituents of the milk, but to a number or all of them. Our knowledge of the composition of milk has been materially advanced within the past few years. It has been shown that it is a much more complicated fluid than the general analyses show. Besides the usually stated gross composition, it has been shown to contain small quantities of a considerable number of substances. Among these we may mention lactoglobulin, albumose, peptone nuclein, lecithin, citrate of calcium, a starch-liquefying and a proteolytic ferment. Besides these more or less useful substances, certain excretory or waste substances have been found, as urea, hypoxanthin and other so-called extractive substances. Of these substances it is well known that lecithin is a stimulant to cell nutrition and cell growth. It is also probable that a part of the organic phosphorus of the casein is assimilated and used to give cell nutrition.

That cooked milk is different in nutritive value from raw milk has long been well known. Various unsatisfactory or crude explanations of this fact have been given from time to time, but it is only by a careful study of the minute chemistry of milk that we find the true explanation. The effects of heat upon milk are complicated and extensive. These are not confined to one or two of the constituents, but to nearly all of them, and may be summarized as follows: Cows' milk contains about 3 per cent of casein, while human milk contains but 0.75 per cent. Casein is a nucleo-proteid existing in cows' milk as a neutral salt of calcium.

On heating cows' milk to a temperature of 70° F. or above, it slowly undergoes decomposition, with the separation of calcium phosphate, *i.e.,* a part of the organic phosphorus is converted into inorganic and non-assimilable phosphate of calcium. The casein becomes less easily clotted by rennet, but when clotted it is less easily dissolved by the digestive secretions, and more of it appears in the stools than when raw milk is taken. Lactalbumin exists in cows' milk to the extent of 0.5 per cent , and in human milk in the proportion of about 0.9 per cent. It is believed to exist in combination with some base, and when heated to 160° F., or above, it undergoes a change. It is converted into a colloidal condition, which precipitates on the addition of an acid. When the casein of boiled milk is precipitated by either rennet or acid, the whey is practically free from proteids. The albumin separates with the curd, and it thus increases the amount of curd formed in the stomach.

Milk sugar is found in cows' milk in the proportion of about 4.5 per cent, and in human milk to the extent of about 6.5 per cent. It exists in the form of a hydrate, which is dissociated by heat. This is shown by the loss of rotatory power. When a freshly made solution of commercial lactose is polarized, from time to time the rotation changes for about twenty-four hours. That is, it requires about one day for the dried sugar to reach the condition of hydration that the true sugar of milk possesses. When the solution is boiled for some minutes it does not again seem to regain the normal condition.

Calcium citrate occurs in cows' milk as well as in human milk. Henkel calculates that a good cow yields as much citric acid in a day as will be found in two or three lemons.

On boiling, the calcium citrate is precipitated as an insoluble gritty powder, which is rather difficult to get into solution again, and it is probably mostly lost in the stools. It has been suggested by some recent writers, that, from the well known antiscorbutic action of citric acid, its loss may explain the tendency of boiled milk to favor the production of scorbutus.

The fat of human milk melts at a slightly lower temperature than that of cows' milk, which latter melts at about 96.5° F. Even at the pasteurizing temperature the fat is melted, and crystallizes on cooling. Melted butter fat is less easily digested than raw or unfused fat. The cream rises more slowly from both sterilized and pasteurized milk.

The organic phosphorus which exists in the form of lecithin and nuclein, in milk, is slowly converted into inorganic or non-assimilable phosphates at a temperature of 160° F., but quite rapidly at 212° F. The well-known nutritive action of lecithin is thus largely lost in boiled milk.

The enzymes are destroyed at the pasteurizing temperature, and whatever value they may have, is lost.

Milk that has been heated to 160° F. or above, effervesces with hydrogen dioxide in the cold, while raw milk does not.

Fresh milk, when mixed with a small quantity of paraphenylene-diamine, gives a blue color with a few drops of hydrogen dioxide, while sterilized milk does not.

With the knowledge of these changes in milk on heating, we can explain why so many of the attempts at finding a suitable substitute for human milk have been unsuccessful.

These attempts have been based too exclusively upon gross chemical analyses, and it must be admitted that the analyses of milk published prior to the past few years and many of those of today are either erroneous, or do not give us the whole truth. It is not enough for us to know the percent of fat, sugar, proteids and ash. We know that the fat of cows' milk is not identical with that of human milk, the sugar is believed by Richmond to be different. The casein is different. While human casein is completely dissolved in peptic digestion, cow casein always leaves a more or less voluminous residue of pseudo-nuclein or para-nuclein, which passes with the stools. This insoluble residue gives a nidus for the growth of bacteria, and acts as a foreign body. The ratio between the albumin and casein is very different in the two milks, a matter of great importance in determining the amount and digestibility of the curd. The amount of organic phosphorus, of iron, of lime, etc., have an important bearing upon the nutritive quality of the milk, and ordinary chemical analysis does not inform us on these points.

I am satisfied that a more careful study of the more minute constituents and properties of milk affords the most promise in the solution of the problem of infant feeding. Aside from the chemical study of milk we must give a most prominent place to the bacteriological examination.

Very much of the difficulty we have in the artificial feeding of infants is due to the disturbing effects of bacterial decompositions and irritations in the digestive canal. Very much depends upon the character and the number of bacteria introduced with the food. This has been long recognized, and sterilization by heat was introduced on this account. But this was a failure for the reasons above recited. It does not take account of chemical, physical and nutritive changes produced by the heat.

Those who have studied the subject most carefully have come to the conclusion that when pure, clean, fresh cows' milk can be obtained, it is the best food for infants at our disposal. By fresh cows' milk I mean that which has not suffered any change in composition from the growth of bacteria or other agency. The number of bacteria present in a milk is the best guide at present known, in the absence of antiseptics, to its fitness for infant feeding. This is the equivalent of stating that this is the best index of cleanliness and proper care of the milk in handling. Investigations made by me during the past summer show that the health of infants is very greatly affected by the question of the number of bacteria in their food.

During the latter part of September a number of babies fed upon a certain supply of certified milk were found to suffer with green curdy fermenting stools. This change in the babies was coincident with a very great rise in the bacterial count in the milk. As soon as the high bacterial count was corrected the babies resumed their normal condition. The only change to be found in the milk was in the number of bacteria. Although the most of the bacteria found in milk are those which produce lactic acid, it has been found in the course of the work of the Milk Commission that the acidity does not follow the number of bacteria. The milk-testing tablets sometimes recommended for the detection of bad milk can not, therefore, be of much service, except to detect sour milk.

The temperature at which milk is kept after milking exerts an enormous influence on the growth of the bacteria.

Bacterial growth for most species is limited to the temperatures between 40° F. and 122° F., and the temperature of the most rapid growth is about between 90° and 100° F.

The number of bacteria in milk when freshly drawn is subject to wide variations in different cows, and in mixed milk of a number of cows taken with aseptic precautions it will vary from about 500 to 3,000. When the first milk from each teat is rejected, the remainder of the milk, when taken with aseptic precautions, will usually contain but a few hundred bacteria per c.c., or it may be almost sterile. In the production of certified milk a portion of the fore-milk is rejected, especially in hot weather, for this reason. When milk is taken from the cows with reasonable precautions as to contamination with dust and dirt, the number of bacteria need not be higher than 1,000 per c.c. If such milk is kept at a temperature below 60° F. the number of bacteria grows slightly less during the first four hours, owing to the germicidal action of fresh milk. In some cows this action is more pronounced than in others, and frequently is observed for six hours at 70° F. If, then, the milk be cooled to 45° F., and kept at that temperature, and without exposure to the air, the number of bacteria present at the end of 24 or 36 hours may be less than at the time of the milking. This is what is aimed at in the production of certified milk, and it can be attained, by care, with a great deal of success.

Having such milk, with all its constituents and properties preserved in their natural conditions, and fairly uniform in chemical composition, so far as the grosser constituents are concerned, because it is received daily from the same herd of cows, we certainly have a good foundation for preparing a suitable infant food.

The milk furnished under the seal of the Milk Commission of the Medical Society of the County of Kings contains at least 4 per cent of fat, and not much more than 4 per cent, and not more than 30,000 bacteria per c.c., even in hot weather. The average number of bacteria in market milk served in bottles is from 100,000 to 250,000 per c.c. That from the best dairies, 15,000 to 100,000, and that served in cans from 500,000 in winter to several millions in summer, frequently reaching 100,000,000, in the case of "grocery milk."

It is self-evident that milk served in cans and milk brought to the city in cans and bottled here is not fit to be fed to infants. So-called "grocery milk" or milk kept in any store where proper facilities for keeping it at a temperature below 50° F. are not at hand, should not be allowed to be sold.

No known process of modification, pasteurization or sterilization can make such milk a fit food for infants or young children. Pure, clean milk, constantly kept at a temperature below 50° F. and not more than 48 hours old, is the only proper basis of food for the artificial feeding of infants. Even this will usually require some form of modification for infants under eight or nine months of age, at which time nothing more than slight dilution with water will usually be demanded for normal, healthy infants.

As I have elsewhere shown, the best diluent for milk during the first few months is whey. During the past three or four years this idea has been rapidly gaining ground.

The only reasonable ground of objection to this method is the complexity of the formulæ that have been published for its execution. These formulæ have been made unnecessarily complicated. Since commercial cream is almost universally sour and swarming with bacteria, we should reject all cream mixtures requiring its use.

With the top milk from a bottle of certified milk and whey we may do much better. The exact percentage composition of the laboratories is unnecessary, as the digestive capacity of infants is elastic enough to accommodate itself to the slight variations obtained in home modifications. Too much stress has been laid upon these exact figures. A number of investigations have been made of the composition of the top milk taken from the ordinary, well-creamed bottle as received from the dealer.

Dr. Winter and Dr. Chapin especially have made such studies and given us their results. As their results do not quite agree I have lately gone over the ground and I give the results of all three analyses for comparison:

For 4 per cent. Milk	Winter	Chapin	Bartley
Fat in top 8 oz.	17 per cent.	13.3 to 14	14.5
Fat in top 11 oz.		9.7	10.
Fat in top 16 oz.		7.	7.5
Skim milk			.5

My results agree fairly well with those obtained by Chapin. For ordinary work these three grades of top milk are all that will be required. The most recent analyses of human milk show that it is subject to rather wide variations in composition, even when the nursling thrives in a normal way. This shows that the average infant can tolerate rather wide variations in its food without trouble, and extreme accuracy in the proportion of the constituents is not essential. In feeding sick babies, we find that the only certain rule is the *try-rule.* In other words, we select what we think will agree, and if it does not, we try again until we have adjusted the food to the needs and capacity of the case in hand.

In the first trial it will be found necessary to reduce both the casein and fat below what a healthy infant of that age ought to have, and then increase them to the point of tolerance. The following table gives the average composition of the constituents of human milk, cows' milk, skim gross milk from the ordinary well-creamed bottle and whey made from this skim or bottom milk.

	Human Milk	Cows' Milk	Skim Milk	Whey
Fat	3.50	4.00	0.50	0.30
Casein	.75	3.00	3.00	0.00
Albumin	.90	.50	.50	.86
Sugar	6.50	4.50	4.50	4.50
Salts or Ash	.24	.68	.68	.60

The composition of whey here given is the average of the results given by eight analysts. I have found results which agree fairly well with the above figures. In two trials of milk that had been brought to the city in cans, and bottled here, I found one per cent of fat in the bottom milk after 24 hours, and 0.86 per cent of fat in the whey made from it. The top milk contained a correspondingly less amount of fat. The casein in the top milk may be one- or two-tenths of a per cent less than that in the whole milk, but the difference is so slight that it may disregarded. As we have above said, we will rarely need anything more complicated than the top 8 ounces, top 11 ounces, and top 16 ounces, the whey made from skim milk and milk sugar. In some rare cases where the infant cannot tolerate .75 per cent of casein, we may add egg albumin to increase the non-coagulable proteid. When this is done, the eggs must be fresh, as stale eggs are apt to produce putridity of the stools, especially in hot weather. With the three grades of top milk, viz., one-quarter, one-third and one-half of an ordinary quart bottle, we may form a variety of mixtures of different composition as shown in the following table. These values are understood to be closely approximate, but after an experience of five years with such mixtures I am convinced that in my hands they have been more successful than any others I have ever tried, not excepting the exactly adjusted percentages of laboratory milk.

MIXTURES WITH THE TOP 8 oz. MILK OR FOURTEEN PER. CENT FAT MILK.

Top Milk	Whey	Fat	Casein	Albumin	Sugar	Salts
1	3	3.7	.75	.77	4.5	.60
1	4	2.9	.6	.79	4.5	.60
1	5	2.38	.5	.81	4.5	.60

MIXTURES WITH TEN PER CENT TOP MILK.

Top Milk	Whey	Fat	Casein	Albumin	Sugar	Salts
1	2	3.43	.1	.75	4.5	.60
1	3	2.62	.75	.77	4.5	.60
1	4	2.1	0.6	.79	4.5	.60

MIXTURES WITH 7.5 or 8 PER CENT TOP MILK.

Top Milk	Whey	Fat	Casein	Albumin	Sugar	Salts
1	1	3.9	1.5	.68	4.5	.60
1	2	2.6	1.	.75	4.5	.60
1	3	2.00	.75	.77	4.5	.60

One heaping tablespoon of sugar to the quart adds ½ oz or 1.5 per cent. The white of 1 egg adds to a quart .3 per cent of albumin.

We have assumed that the whey for the above mixtures is made with rennet, and that the curd is well beaten during the process of clotting. When made in this way, my analyses show that about .2 per cent of the fat of the skim milk is lost in the curd. That is, if the skim milk contains 1 per cent of fat the whey will contain .8 per cent; if it contains .5 per cent the whey will contain .3 per cent.

The whey must be heated to 150° F. before making the mixtures, to kill the rennin ferment.

By the addition of a heaping teaspoon of bicarbonate of soda to the quart it need not be heated at all, as rennet will not coagulate milk containing two grains of $HNaCO_3$ per ounce.

For a complete bibliography, the reader is referred to Nothnagel's System of Practical Medicine, Vol. 3, English Edition.

SOCIETY PROCEEDINGS

FOURTEENTH INTERNATIONAL MEDICAL CONGRESS

Held in Madrid, April 23-30.

Section in Pediatrics.

(*Specially reported by Cable for Pediatrics.*)

We have time only to print this month a few abstracts of papers read before the Fourteenth International Medical Congress at Madrid as we go to press. The meeting, as reported by our cable correspondent, was well attended, there being over seven thousand physicians in attendance. Over two hundred were from the United States.

Bacteria of Chorea, Endocarditis and Rheumatism.—Dr. F. J. Poynton and Dr. F. S. Paine of London, who have been doing some excellent work on the bacteriology of rheumatism, and who have discovered what they consider the cause of this disease, emphasized the clinical evidence in favor of the rheumatic origin of chorea. They said that after injecting a rabbit with the diplococcus of acute articular rheumatism the animal developed a chorea, and the microorganism was demonstrated in the pia mater and the endothelium of the cortical capillaries. This experiment had been repeated and confirmed by Fritz Meyer. Paine had also found micrococci in the mitral valve, the cortex and the pia, in a case of human chorea. The urine in one case of chorea showed the same diplococcus, which produced chorea, endocarditis and rheumatism in a rabbit. The author said chorea might also be caused by other bacteria, as those of erysipelas, or the pyogenic forms.

Spinal Cocainization in Children.—Dr. P. B. Diaz of Saragossa presented a series of fifteen operations on children varying from four to sixteen years of age with spinal cocainization. The results that he obtained were very satisfactory, and he had no ill after effects.

Ophthalmia Neonatorum.—Dr. J. V. Portello of Valencia read a paper reciting in detail his treatment in cases of ophthalmia neonatorum. The chief feature of importance was his condemnation of nitrate of silver, of corrosive sublimate and of iodoform, all of which, he said, were too caustic and only promoted the progress of the infection. On the other hand, he lauded protargol. He described a new irrigator.

CORYZA IN NURSLINGS AND SYPHILIS.—Dr. L. Carralero of Madrid said that a persistent coryza is one of the most constant, in the majority of cases the earliest, and at times the only symptom of hereditary syphilis in infants. In the latter case the differential diagnosis may be difficult, but all cases of rebellious coryza in infants should be laid to the door of a diathesis or of syphilis. In itself it is a very dangerous condition, inasmuch as it prevents proper suckling, and leads to bronchopneumonias, otitides, etc. The treatment is, of course, a general antisyphilitic one, combined with local measures.

PERIODS OF GROWTH.—Dr. J. Atlassof of Kiew said that growth was particularly rapid at certain periods of life, which periods varied from one to three in number in various individuals. These periods are marked by predisposition to disease. During such times the organism should be subjected to no unnecessary strain, especially not to that of overstudy.

THE MUSCULAR DYSTROPHIES.—Dr. Criado of Madrid advanced the theory that the muscular dystrophies were of bulbar origin, supporting his claims by the general clinical development of the cases, but by no pathological proof to support his contentions.

TREATMENT OF TUBERCULOSIS IN CHILDREN BY MEAT JUICE AND RAW MEAT.—Drs. A. Josias and T. C. Roux of Paris reported the results of their treatment of children with 150 gms. of muscle juice and 100 gms. of raw meat each day, in 46 cases of tuberculosis of all types, of which 30 had pulmonary affections. They conclude that the treatment ameliorates the general condition noticeably, increases the weight, and arrests the progress of the local disease. Moreover, the cure is permanent. In cases of very profound disturbance and advanced cavity-formation, the treatment is frequently without avail.

IS TUBERCULOSIS TRANSMISSIBLE BY COW'S MILK?—Dr. H. Rehn of Wiesbaden stated that in a case under observation, bovine tuberculosis had not been transmitted through the milk to a human infant.

HUMAN MILK FOR INFANTS.—Dr. Monti of Vienna urged that in view of the fact that human milk was the only food proper for infants, it should be made accessible to all classes of the population. He proposed the foundation of institutions of wet nurses, for the use of such of the poor as have need for it.

TREATMENT OF CLUB FOOT.—Dr. O. Vulpino of Heidelberg said that all cases of hereditary club foot should at first be treated by gradual redressment, which might, if necessary, be replaced by operation. Paralytic cases are to be treated by redressment, by transplantation of tendons, if there are any sound muscles, or, if not, by arthrodesis. Orthopedic apparatus are only a last resort.

Serotherapy in Diphtheria.—The noted French President, Dr. Jules Comby, read a very full paper on serotherapy in diphtheria. He stated that its effects, both locally and generally, were of enormous benefit. The subsequent anemia, languor and feebleness were due not to the serum, but to the diphtheria. It might, however, produce menorrhagia or metrorrhagia, also urobilinuria, albuminuria and other urinary disturbances, which were, however, only ephemeral. In every case of even suspected diphtheria, the injection should invariably be made, even if the case were of mild type. In cases of laryngeal diphtheria, of malignant types, or late cases, the dose should be doubled, and may be repeated in twenty-four hours. The injection is indicated in all localizations of the infection, and for post-diphtheritic affections (paralysis). Malign cases present no contraindication. In benign cases, if complicated by a pulmonary tuberculosis, or by an old nephritis, only feeble doses should be employed. The serum decreases the mortality by three-quarters, and if employed within the first forty-eight hours, abolishes it. The most serious and confusing complication is furnished by the eruptions, which may be primary (first day), early (within one week) or late (two weeks or more); they are accompanied by fever, and uremic measles, scarlet and other exanthems.

(*To be continued.*)

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN

An ordinary meeting of the Society (London) held February 20, 1903,

DR. EDMUND CAUTLEY in the Chair.

Mr. H. J. Curtis showed a specimen of a congenital periosteal sarcoma which apparently sprang from the acromion process of the left scapula of a boy from whom it had been successfully removed at the age of five and one-half months. At birth it was the size of a small hen's egg. It was a mixed spindle-celled and round celled growth.

Dr. G. A. Sutherland showed a child, aged 5 years, with marked ataxia, which had been present from the time he had commenced to walk. He considered that possibly the condition might be due to a congenital cerebellar lesion. The superficial and deep reflexes were normal. There were no changes in the fundis oculi or paralysis of the ocular muscles.

Dr. Fletcher Beach considered that since the labor had been a difficult one the possibility of a cerebellar hemorrhage could not be excluded.

Dr. James Taylor, although he agreed in some respects with Dr. Beach, nevertheless considered it possible, that cases similar to those described by Marie, which manifested themselves later on in life, might occasionally occur in children at this early age. Dr. Sutherland replied.

Dr. James Taylor showed a case of well-marked achondroplasia in a child of eight years. She was the seventh child, the others being healthy. She presented a characteristic deformity of the head, the humeri and femora were remarkably short, and trident-like hands were present. Her intelligence was not defective. As was frequently the case, her weight was increased for her size.

Dr. Travers Smith remarked on the shape of the head.

Dr. Edmund Cautley thought the condition should be kept distinct from fetal rickets and remarked that it had been suggested the condition might be due to osteomyelitis.

Dr. Taylor, in reply, referred to a similar disease in some animals.

Dr. A. Morison showed a case of Raynaud's disease in a boy eight years old which first manifested itself at the age of four and one-half years. He did not suffer from hemoglobinuria and there was no evidence of congenital syphilis. Some of the attacks, as in the present case, were attended by the presence of blood-filled bullæ. Examination of the patient's blood showed nothing abnormal.

Dr. Beach mentioned a case in which a successful result had been obtained by the use of Esmarch's bandage.

Mr. George Pernet called attention to the fact that scleroderma and sclerodactylia might follow Raynaud's disease. Dr. Theodore Fisher mentioned a case in which a condition similar to that of Raynaud's disease appeared in one hand as a sequence to a blow. He thought a strong peripheral stimulus might induce central nervous disturbance.

Dr. Leonard Guthrie thought the child syphilitic. He was also of opinion that paroxysmal hemoglobinuria and Raynaud's disease were syphilitic manifestations.

Dr. Taylor could not accept Dr. Guthrie's dictum that hemoglobinuria and Raynaud's disease were necessarily syphilitic.

Dr. Cautley agreed with Dr. Taylor but referred to a case of symmetrical gangrene which yielded quickly to antisyphilitic treatment.

Dr. Morison replied.

Dr. Leonard Guthrie showed a slightly rickety infant, aged two years, whose ligaments were unduly lax and whose muscular system was wanting in tone. He could not make up his mind whether it was in the nature of rickets or of a congenital defect or want of development.

Dr. Sutherland considered it a case of rickets in which the stress had fallen upon the ligaments and muscles rather than any special congenital defect.

Dr. Cautley suggested that the condition was one of mal-development rather than rickets.

Dr. George Carpenter read a paper on four cases of heart disease, two of which clinically could have been mistaken for mitral valvular disease. In one a presystolic murmur was present, suggesting mitral stenosis. In three of these cases after death the valves and pericardium proved healthy, but the hearts were hypertrophied and dilated, and disease of the myocardium was present. In the fourth case, one of heart failure following diphtheria, in which a mitral murmur was present, associated with a pulsating liver, complete and rapid recovery took place with disappearance of the murmur.

Dr. A. E. Sansom commented upon Dr. Carpenter's cases. He thought the subject of myocarditis required further investigations and clinically at present it is almost impossible to diagnose such affections of the heart-muscle, seeing that not only mitral systolic bruits, but presystolic murmurs also were present in such cases.

Dr. Fisher expressed his interest in Dr. Carpenter's observations and referred to his own pathological experience of complicated myocarditis. He also commented upon the presence of presystolic murmurs in cases in which there was neither mitral stenosis nor aortic valvular disease.

Dr. Carpenter replied.

PHILADELPHIA PEDIATRIC SOCIETY

Stated Meeting, Tuesday, March 10, 1903

The President, Dr. D. J. Milton Miller, in the Chair

Enlargement of the Cervical and Mediastinal Glands.—Dr. Miller presented this patient. He also had enlargement of the liver and spleen (Hodgkin's disease?). The patient, a boy of fourteen, had had scarlatina when sixteen months old, but no other affection that could have any bearing upon his present condition. The glandular enlargement began at seven years (1896), after a "cold," and soon attained great size, occupying the left side of the face and all the triangles (left) of the neck. The glands never suppurated. They were removed in 1899 and, because of recurrence, again in 1900 and 1901. At this time, one of the removed glands—the only one that microscopically appeared tuberculous—was found to show "tubercle, areas of cheesy degeneration, and giant cells."

Until 1902, only the left glands had been affected. At this date the enlargement returned on the left side and, for the first time, appeared on the right side also. The patient was then submitted to a fourth operation by Dr. G. G. Davis, all the affected glands on the left side being removed. One of the extirpated glands showed "marked proliferation of connective tissue and great increase of cellular elements; no giant cells; no evidences of tuberculosis."

The patient was then transferred to Dr. Miller, who desired to try the tuberculin test; but the preparations for this alarmed the patient, and he left the hospital. Before he did so, however, a careful examination revealed, in addition to the cervical enlargement, marked evidences of a similar implication of the glands of the posterior mediastinum, not only by physical signs, but also by the Röntgen rays. There was also a large bunch of glands in the throat, pushing forward the uvula and half filling the pharyngeal cavity. The vocal cords were normal. The spleen extended two fingers' breadths, and the liver one finger's breadth below the costal border. The superficial abdominal veins were enlarged, but no mass could be discovered in the peritoneal cavity. Slight enlargement of the axillary and inguinal glands existed, but not more than is often observed in healthy persons. The urine was normal; and the temperature during the boy's whole stay in the hospital had never been above normal,—usually from 97 to 98 degrees F. A blood examination showed: Red blood cells, 4,104,000; white blood cells, 8,000; hemoglobin, 69 per cent. The differential count showed: polymorphonuclears, 70.6 per cent; large mononuclears, 24.8 per cent; small mononuclears, 2.4 per cent; transitional forms, 8.2 per cent—in a word, a moderate anemia without any definite characteristics.

Dr. Miller believed the case to be one of lymphatic tuberculosis: first, because of the tuberculous gland that had at one time been found; secondly, because of its long duration (seven years), without impairment of the general health beyond slight anemia; thirdly, on account of the patient's age, as Hodgkin's disease is not an affection of childhood. He regretted that the tuberculin test could not have been tried; but he said that this would not have been conclusive, as only inoculation could have settled the question. The case is probably an instance of the slowly progressing form of gland-tuberculosis, in which caseation, softening, etc., are unusual. The fibrous condition of one of the glands also favors this view. The patient presents the physical signs of Hodgkin's disease, but not the general symptoms. It is true that there is strong evidence that many cases of Hodgkin's disease are directly referable to tuberculosis; *i.e.,* that the disease is a tubercular adenitis, without other tubercular disease—a view held by Sternberg, Musser and Sailer. That this is true of all cases, is doubtful. Dr. Miller is of the opinion that under the term Hodgkin's disease we have a variety of pathological conditions, but that many of the cases are tuberculous in origin.

Whatever its etiology, Hodgkin's disease presents a definite clinical picture: enlarged glands, spleen, and liver; progressive emaciation; and a more or less rapidly fatal issue. In Gowers' fifty fatal cases, only one had a duration of five years. This patient, apart from the glandular and visceral enlargement, gives a totally different picture: He is in good health, although the condition has existed seven years. Dr. Miller, therefore, does not think that we should classify this boy's affection under the head of Hodgkin's disease, although that disease may in every case be but a form of lymphatic tuberculosis. Hodgkin had a definite symptom complex in mind when he described the disease that goes by his name, although he knew but little of its etiology.

Dr. Edsall, in discussion, said that Sternberg seems to be rather generally credited with the view that all cases of pseudoleukemia are actually tuberculosis. As a matter of fact, however, that author, in a discussion in the Vienna Medical Society a year ago, insisted upon his belief that, as a rule, chronic tuberculosis of the lymphatic glands may be distinguished from true pseudoleukemia. Dr. Edsall asked particularly about the temperature in Dr. Miller's case, as Sternberg had referred especially to abnormalities in the temperature and to lesions of the mucous membranes as being strongly suggestive of tuberculosis.

Dr. Miller, in reply to Dr. Edsall, said that the boy's temperature had had a constant tendency to be subnormal. He agreed that the tuberculous form of chronic glandular enlargement is a variety that is distinct from true Hodgkin's disease. He did not coincide in the view that has recently been expressed by a number of authors,—for instance, Dr. Musser and Dr. Sailer,—to the effect that Hodgkin's disease is always tuberculous. He believes, also, that the tuberculous variety of chronic glandular enlargement may often be definitely diagnosed as such.

The point of chief interest to Dr. Miller in this case is its relation to Hodgkin's original description of the disease that goes by his name. This description constitutes a very distinct clinical picture. The conditions in this boy materially differ from this picture, chiefly in the fact that the disease has been present for seven years; and that, although it has caused pronounced enlargement of the cervical glands, has advanced into the mediastinal glands, and is associated with enlargement of the spleen and liver, yet the patient's general health continues to be good. The affection described by Hodgkin is a fatal one, most cases lasting but a few years. Gowers found only one case that lived as long as five years.

Multiple Ossifying Periostitis.—Dr. George W. Norris showed a boy, thirteen years old, with multiple ossifying periostitis. His family history is negative. He has had the usual diseases of childhood. At the age of nine months his mother noticed small lumps on the child's ribs. About one year later, small, hard growths began to appear on various parts of the osseous system. These have steadily increased in size—of late, with greater rapidity than formerly. At present, hard, stalectiform excrescences are to be seen and felt on both tibiæ and radii, near the right trochanter, on the scapulæ, etc. They vary in length from 2 to 20 mm.; are firmly attached to the bones; occur, as a rule, near the epiphyseal junction; and are shown to be of bony structure by the X-ray. They cause no pain, except by pressure on the overlying skin; and do not affect the joints, save by restricting motion. There is no evidence of rachitis, and a general physical examination fails to disclose any abnormality of the thoracic or abdominal viscera. During the last five years, the boy's physical development has been stationary; and lately he has had to desist from active games, owing to encroachment of the bony growths upon the joints. Examination of the urine reveals nothing of pathological import. Potassium iodide has been administered without benefit.

Dr. Hand said that a number of years ago he had seen a case quite similar to that of Dr. Norris, while working with Dr. Hopkins in the dispensary of the Pennsylvania Hospital. In that case there were a great many bony protuberances and marked dwarfing. The patient was a man, but he was not much taller than the boy exhibited by Dr. Norris. The occurrence of dwarfing in both these cases shows that the disorder that produces the bony change also apparently stunts the growth of the patient. The fact that the man seen by Dr. Hand had lived to maturity and was in good general health suggests that the prognosis of the condition as to life is good.

Dr. Jopson said that he had never seen a case like the one presented, although he had seen a number of cases with multiple exostoses, the differences between such cases and this being apparently principally one of degree. The fact that the bony deformities occur chiefly at the epiphyseal junctions, that the long bones show some bowing, and that the patient is dwarfed, and also the shape of the head and the beading of the ribs, strongly indicate, to Dr. Jopson's mind, that the patient is rachitic. We certainly know very little about the cause of conditions of this kind, the only other possibility that is at all suggestive as an explanation being a displacement of the osteogenetic centers.

Dr. Eshner has recently seen, in Dr. John K. Mitchell's service at the Orthopedic Hospital, a girl that exhibited enlargement and distortion of many of the phalanges, and of some of the metacarpal bones of the hands, and of the lower extremities of the bones of the arms. The condition was thought to be due to rachitis. A sister of this patient was under treatment for epilepsy and mental deficiency; and the possibility suggested itself that some hereditary defect or nutritive disturbance underlay the disorder in both instances, exhibiting itself in one case in a disturbance of the nutrition of the nervous system, and in the other in a disorder of bone-nutrition.

Dr. J. P. Crozier Griffith said that he felt compelled to differ with the opinion expressed, that the condition exhibited by the patient is in any way a form of rachitis. There are practically no evidences of rickets; and, on the other hand, said the speaker, all the members of the Society are familiar with very severe deformities of the bone occurring in advanced cases of rickets, but probably none have often, if ever, before seen just such a condition as this boy presents. If the condition be rachitis, surely severe cases of rickets should have more frequently shown something like this. In watching medical literature, Dr. Griffith has noticed quite a number of instances of multiple exostoses reported during the last few years. The conditions seem to have been similar, in many respects, to those of the patient presented. As far as he could remember, all the cases began in infancy.

He said, also, that the various forms of disease of the bone developing in infancy and childhood, are of extreme interest. Some forms can be distinctly differentiated; for example, those of rickets and of syphilis. Others cannot, and seem almost to shade into each other in a peculiar manner. As in the case of rickets, Dr. Griffith thought that syphilis, too, could be excluded in this patient. Although exostoses may readily occur in a syphilitic periostitis, and although in one syphilitic case under his observation the condition of a part of the body is very similar to that of the patient exhibited; yet the peculiar sickle-shaped tibiæ characteristic of the syphilitic disease, and very marked in Dr. Griffith's patient, are entirely absent in the patient shown.

Dr. Judson said that the case reminded him of the condition termed hyperplastic fetal chondrodystrophy. The epiphyseal deformities, the disorder of bone-growth, and the shortening of the extremities, are such as one sees in persons that have been the subjects of that affection. The mother has stated that this child was surpassed by his younger brother in height and in general development, and that all her other children were much larger at the age of the boy now before the Society.

Dr. D. J. Milton Miller said that it seems to him that the continued existence of the disorder at this boy's age indicates that it is not chondrodystrophy, as the majority of such cases die early. He mentioned that the patient's calves look unusually large, and asked Dr. Norris whether he thought there was any evidence of the presence of pseudohypertrophic muscular palsy.

Dr. Norris said he wished to add to what he had already said that the boy had always been very intelligent, and quite as active muscularly as other children of his age. When he first saw the case, Dr. Norris had at once noticed that the calves were much enlarged, and had thought of pseudohypertrophic muscular palsy; but there was no evidence whatever of the presence of that condition. He then came to the conclusion that the enlargement of the calves had probably been due to the bony growths on the tibiæ, deep under the muscles. He has in his possession skiagraphs of the boy that show that the growths on the bone are themselves bony, and not cartilaginous. The shadows produced by them are quite as dense as those caused by the bone. Dr. Norris said that he had called the condition multiple ossifying periostitis because he did not know what other name to give it. He had adopted this term on account of having seen in Stengel's Pathology a description of a similar condition under that name.

Dr. L. H. Bernd reported a case of pericarditis and endocarditis in a child that had had repeated attacks of rheumatism. After the second attack, a mitral systolic murmur developed. There was also marked gastric disturbance, and a very striking tachycardia appeared. With the tachycardia, the murmur disappeared, because of the weakness and rapidity of the heart's action. Friction sounds developed. The respirations ranged from 44 to above 100. Dr. Bernd directed especial attention to the free stimulation that had been given the child hypodermically, using strychnia, digitalis, and camphorated oil. Inhalations of oxygen were also used; and it was apparently only this free stimulation that had carried the child through the attack. He left the hospital in a satisfactory condition.

Adenoids.—Dr. W. G. B. Harland read a paper on adenoids as a cause of enlarged tonsils and other diseases. He said that enlargements of the tonsils depend upon a constitutional tendency toward lymphatic enlargements, and upon irritation and infection. The latter are chiefly due to the mouth-breathing produced by adenoids. Transient forms of croup in children are also due to laryngeal irritation caused by the mouth-breathing occasioned by the presence of adenoids. The more serious forms of croup are produced, in part, by the pressure of enlarged cervical glands upon the recurrent nerves, these glands being infected from throat-inflammation, the result of adenoids. As pointed out by Packard and others, the function of the normal tonsil is to protect the organism from infection. This it is able to do, unless, through mouth-breathing, the amount of infection be increased. Once infected, the tonsils become foci of infection. The lymphatics and the cervical glands are affected, and in this way bacteria and toxins reach the organs and the blood. The poisons remain latent until some exposure lowers the vitality of the person. These remote changes caused by adenoids may exist long after the adenoids have disappeared.

It may be regarded as a rule that adenoids in young children should be removed: (a) if the tonsils are enlarged; (b) if the child has attacks of croup; (c) if it has frequent colds, sore-throat or other throat infection, or nasal obstruction. One can thus prevent immediate drains upon the vitality, and also serious infection later in life. In every doubtful case the operation should be performed.

Dr. Edsall said that the report of Dr. Bernd's case followed by Dr. Harland's paper had led him to speak of a condition not mentioned by Dr. Harland, in which disease of the pharyngeal and nasopharyngeal lymphoid tissue is certainly of importance; viz., in rheumatism; also in endocarditis definitely associated with rheumatism, and sometimes when not so associated. It has been very clearly indicated by the work of Menzer and Meyer, as well as by that of others, that this lymphoid tissue is very frequently the point of infection in rheumatism, in rheumatic endocarditis, and sometimes in endocarditis that is not definitely associated with rheumatism. From a clinical standpoint, this question has been very clearly and carefully discussed by Dr. Frederick Packard. Dr. Edsall believes that this work is of importance in connection with treatment; and thinks that in cases exhibiting a tendency to recurrent rheumatism or to recurrent endocarditis, and even when there has been but one attack of rheumatism or of endocarditis there should be persistent and careful local treatment of disorders of the tonsils or of the nasopharynx. This treatment should be operative, if necessary; and such patients should habitually use mild antiseptic local applications, especially at the time of year when, because of atmospheric conditions, rheumatism is likely to reappear. Treatment in such cases should be carried out with particular rigidity and persistence, in order to attempt to prevent further general infection.

Dr. Walter Roberts said that very small adenoids undoubtedly produce many conditions that are not commonly recognized as being due to these growths, and that removal of the adenoids will often cure. The conditions that he had most frequently found to be due to adenoid growths are acute catarrhal states of the Eustachian tube and of the middle ear; and he said that catarrhal deafness may, in its early stages, often be entirely relieved by the removal of adenoids. He also believes that rheumatic cases may frequently be improved by persistently treating the throat. He was not prepared to say that adenoids should always be removed as soon as discovered; but he does believe that they should often be removed, even though they are not causing the appearance of typical, old-fashioned adenoid disease. In older children, the growths may be readily removed by using only cocaine as an anesthetic, if the sharp curette is used in performing the operation. When this instrument is employed, there is very little pain with cocaine anesthesia; but with forceps, cocaine anesthesia is always painful.

Dr. Bernd said that in making inspections of school children he had often noticed that mouth-breathers are generally backward in their studies. In some instances he has persuaded the parents to have the children's throats operated upon; and in these cases mental improvement has almost always followed.

Dr. D. J. Milton Miller asked Dr. Harland, first, how early adenoids should be removed; and, secondly, whether it is harmful to remove them a number of times. He particularly wished to know whether one should remove adenoids as soon as discovered, in order to avoid the occurrence of symptoms; or whether one should wait for the occurrence of symptoms due to the growths before interfering. His own experience has been that, if removed very early, the adenoids often recur; and that, unless removed again at least once, they ultimately produce typical adenoid symptoms. The very early operation, therefore, seems to necessitate a second; and Dr. Miller wondered whether the operation itself has any tendency to cause the adenoids to recur.

Dr. Walter Roberts said that he wished to add that eye-conditions are sometimes very unfavorably influenced by the presence of adenoids. He mentioned the case of a child with ulcer of the cornea, in which careful and varied treatment had been entirely ineffectual. Small adenoids were present, but these had not been thought to have any connection with the eye-disease. They were removed, however; and the ulcer of the cornea immediately showed improvement, and disappeared with astonishing rapidity.

Dr. Harland, in reply, said that the point that he had most wished to insist upon in his paper was that if one waits until systemic infection of any kind has occurred, the proper time for operation has already passed. In such cases, the glands near by are already infected, and often remain so; and local treatment will no longer control this infection. The proper method is to treat these cases locally as soon as the disease is discovered to be producing symptoms, and not to wait until more serious trouble has ensued. If there is any mouth-breathing, Dr. Harland believes that one should operate at once; and he has always found the adenoids to be much larger than had been expected previously to operating.

As to the question of backward children, he believes that those with adenoids are often backward in their studies—not so much because the growths have produced any mental change, as because they have produced deafness. The age that he considers most suitable for operation is from three to four years. Ordinarily the adenoids cause no symptoms before that time, and, therefore, do no harm. After this period, however, the child is likely to have frequent colds, ear-ache, or other symptoms referable to the growths; and the occurrence of such symptoms indicates removal. If a child's tonsils are removed, any adenoids present should be removed at the same time. Dr. Harland does not believe that repeated removal will often be necessary, if the first operation is thoroughly done. If there should be recurrence, however, he thinks that there would be no harm in repeating the operation; but that only good would be derived from it.

Edema of the Glottis.—Dr. J. C. Gittings reported a case of edema of the glottis, with a note by Dr. John H. Jopson. The child, five years of age and the subject of Potts' disease, had a mild attack of scarlatina, followed by bilateral suppurating cervical adenitis. Fifteen days after the beginning of the attack, while the adenitis was still active, a slight laryngeal cough developed, followed by acute laryngeal obstruction. Three points that spoke against membranous laryngitis were noted: that there was a distinct snoring-quality to the inspiration; that there was little cough; and that the voice was clear, although articulation was difficult.

Dr. Jopson, in consultation, found the child semi-comatose, with marked respiratory obstruction. Digital examination showed edema of the epiglottis, the arytenoids, and the opening of the larynx, extending to the left half-arch. No membrane could be seen. Intubation was very difficult, and the only relief that this afforded was by the expectoration through the tube of the muco-purulent accumulation from the trachea. The edematous tissue occluded the opening of the tube, as is to be expected in such cases; and the tube was soon withdrawn. The need for tracheotomy was deemed imminent, but permission for this was refused. The child's condition slowly improved under a croup tent, with hot poultices applied to the neck. On the following day, the dyspnea was less; and it gradually disappeared.

The nosology of edematous affections of the larynx, by different authorities, includes an acute phlegmonous inflammation with secondary edema; and a simple or symptomatic edema. The first is due to adjacent phlegmonous inflammation, such as quinsy; or to general infections, such as variola. The second is caused by some morbid change in the kidneys, heart, or liver; by obstruction to the circulation; by vasomotor paresis; or by any general or local condition that tends to produce dropsical effusion. All authorities agree as to the rarity of edema of the glottis, from whatever cause.

Dundas Grant has reported a series of 1,008 cases of scarlatina, in 69 of which adenitis occurred, but without edema of the glottis. Clarence C. Rice has reported 41 cases of edema of the glottis, in 14 of which the cause was a simple acute catarrhal process. Jacob D. Arnold quotes Von Hoffmann's figures of 32 cases of edema glottidis in 6,062 autopsies at the Berlin Charite. Most of these were due to chronic renal or cardiac disease. Such cases are not very likely to find their way into literature; hence, the difference between these and Rice's figures. In the case reported by Dr. Gittings, the attack was due to infection and contiguous inflammation from the adenitis; although the child's "strumous" and anemic condition was a strong predisposing factor.

Dr. Jopson said that Dr. Gittings had referred to the rarity of edema of the glottis in scarlet fever. Several authors refer to this fact as being in marked contrast with the conditions in measles. Dr. Jopson's experience has been entirely in consonance with this. He has operated upon about 75 cases of laryngeal stenosis, 9 of which were associated with or consecutive to measles. Dr. Gittings' case is the only one operated upon by Dr. Jopson that was definitely due to scarlet fever. In this case it is practically unquestionable that diphtheria was absent, and Dr. Jopson believes that laryngeal trouble was a secondary result of the scarlatinous angina and adenitis.

Dr. Harland mentioned a remedy that he had seen used twelve years previously, in a case of edema of the glottis in which other remedies had been without avail, and in which those in attendance were prepared to perform tracheotomy at once. The case occurred in the Germantown Hospital, and Dr. Müller suggested the use of Monsell's solution in the steam-atomizer. The patient had been for a long time in dreadful distress; but within three minutes after employing Monsell's solution she was breathing quietly, and she had no further trouble.

Dr. Harland referred to the fact that pressure upon the laryngeal nerves causes first closure of the cords and then paralytic relaxation. He suggested that in this case the adenoids of the neck may have been a factor in producing laryngeal stenosis, acting by pressure upon the nerves.

Dr. Miller mentioned a case of laryngeal stenosis in a patient with purpura. In that case there was a purpuric eruption in the larynx, with tremendous edema. Adrenalin was used locally and internally without any effect, and the case ended fatally.

EDITORIAL

THE BIOLOGICAL CONTROL OF SMALLPOX VACCINE

THERE is little reason for discussing the question of the desirability, nay, even the necessity, of making some control of smallpox vaccine before its use. It is to be regretted that up to the present time very few of our large manufacturers of vaccine virus have ever made complete biological controls of their products.

Two very important considerations are, we believe, self-evident: (1) An impure virus is prejudicial to the health of the vaccinated person because of the secondary infections that it may give rise to, and (2) an inactive virus, or one of diminished activity, either confers no immunity whatever or an immunity of a very minor grade.

Dr. C. Gorini, Professor of Bacteriology in the Royal High School of Agriculture of Milan, in a recent number of the *Revue D'Hygiene et de Médécine Infantiles,* 1903, No. 2, brings up once more this question which, in 1898, he first propounded. At that time he proposed a method of control of the vaccine by means of corneal inoculations in rabbits, and was enabled to determine with a certain amount of precision the efficiency of the virus which he used. In the present communication he returns to the subject with a rich experience and is able to confirm his previous claims, and adds as well a number of new facts. In submitting vaccine to bacteriological investigation, it is very evident that one can determine the number and the species of the bacterial forms which are there found, but such investigation leads to no results on the question of the virulence of the organism. While the bacteriological study, therefore, can determine to a limited extent the character of the secondary infections that may result from the use of infected virus, it cannot inform the investigator as to the grade of immunity that may be conferred by the vaccine used.

For the protection of the public against the secondary affections a rough bacteriological test is employed by manufacturing firms, and no Board of Health should permit the distribution of vaccine that contained more than a minimum number of bacteria, and none of these should belong to a class that is usually considered harmful. In order to determine the second point inoculations must be made in animals or in human beings, but it is to be borne in mind that the virulence of the vaccine varies widely according to the animal species in which the test is made, and it is further to be noted that the animal usually chosen, *i. e.*, the calf, is much more susceptible to the vaccine virus than man. Therefore it should be borne in mind that the value of a test of the efficiency of a vaccine will depend largely on the character of the animal experimented on, and a positive test in a lower animal should not be considered absolute with man.

Further, the determination of the degree of efficiency of a vaccine is only possible when the test does not produce in calves any positive effect of extraneous infection. Therefore the biological control by the method of inoculation of calves presents certain technical and economic difficulties, as, for instance, the preparation of the necessary bacteriological cultures, inoculation of several animals, the virulence of foreign micro-organisms, and the inoculation of one or several calves to determine the efficiency of each batch of vaccine made up. Further, when it is borne in mind that in order to carry out these tests it takes at least a week or two, one can readily see that the ordinarily used tests leave much to be desired.

The author's test, however, of inoculation in the cornea of the rabbit, first proposed in 1898, gives quick results, and, according to this investigator, they are constant. They can be controlled and can be performed with great rapidity; and he believes that the corneal inoculations of vaccine give results which show, at the same time, the value of the vaccine from the standpoint of efficiency and also from the standpoint of purity.

ABSTRACTS

Sudden Death in Children.—In this article KRAUTWIG (*Archiv für Kinderheilkunde,* XXXV. 3-4) shows that tetany is the cause of spasm of the larynx and both will flourish best in the same soil as rachitis. The thymus gland must have some causal relation with rachitis, because of the relation of this gland to bone growth, which seems to be indicated by all evidence thus far obtained. He ascribes the death to the nervous disturbances brought on by the rachitis, laryngospasm, convulsions, with or without bronchitis processes. He rejects the mechanical connection between the thymus and sudden death which has recently been announced by some. In all cases of sudden death in children he urges the profession to make a careful search for stigmata of rachitis but many of the questions in regard to sudden death in the young will not be elucidated until a better knowledge of the essence of rachitis is obtained.

Neurasthenia in Children.—DR. J. MADISON TAYLOR (*International Medical Magazine,* Dec., 1902), calls attention to this affection which will show itself by lack of energy and interest in the general pursuits of childhood. This condition is not rare and may be confused with the results of bad habits, mendacity and hysteria. The physician, however, should always keep the psychic factor in mind. The chief causes he gives are (1) eye strain which should be looked for particularly; (2) cardiac neuroses which are common in children; (3) heart, lung, blood or kidney affections, etc. The treatment consists in plenty of fresh air, the best tonic, all outings being supplemented by rest, proper food, at regular intervals, bathing and sponge baths in a warm room before breakfast, may be found of benefit.

Infantile Diabetes Mellitus.—HOWARD E. LOMAX (*Albany Medical Annals,* Feb., 1903). This subject is treated quite thoroughly by Dr. Lomax in his paper though diabetes in children has not an extensive literature. He describes symptoms, reports cases and discusses the general subject of diabetes, its pathology, and so on, remarking that the records show no recoveries from infantile diabetes. The cases he reports have been of various ages from two to sixteen years and one an adult. Occasional fasts of twenty-four hours' duration he has found to be beneficial at times in removing unfavorable symptoms.

Gonorrhea in Children.—H. Lowenburg (*American Medicine,* Feb. 21, 1903), reports a case of a child of four years who was in the habit of handling rags and clothes from the refuse boxes and probably became infected in this way. He draws the following conclusions from his experience: (1) All urethral discharges in young boys should be viewed with suspicion; (2) all such discharges should be submitted to a microscopical examination; (3) should the gonococcus be found the possibility of the case assuming a medicolegal nature should be remembered; (4) the question of rape should be carefully eliminated or conclusively proved; (5) treatment consists in securing local cleanliness and a free action of the emunctories in conjunction with the administration of urinary antiseptics and alkalies; (6) gonorrhea is no contraindication to circumcision; (7) vulvovaginitis in little girls is often due to gonorrhea.

Infantile Eczema.—Strauss (*Jahrbücher f. Kinderheilkunde* Pt. lvi) states that appropriate internal treatment of the digestive tract will influence eczema in infants, thus distinguishing it from the purely ectogenic parasitic and artificial eczemas of older children. But in infants secondary infection may lessen it and external as well as internal treatment will be required.

Pneumococcus Peritonitis in Children.—Dr. M. Stoos (*Jahrbuch f. Kinderheilkunde* No. 56) says the encapsulated form recovers rapidly after evacuation of contents. When the peritonitis is not encapsulated the prognosis is of a more grave nature. Out of 12 cases collected by him, including one which was personally observed and recovered, nine died and three were cured. He has had three cases of the encapsulated variety also.

Eyestrain of Children.—In his article on the "Care of Eyesight of School Children," Dr. G. C. Eggers (*Medical Age,* Dec. 25, 1902), cites the importance of care of the sight in children and means of preventing injury in school studies and methods, at an early age.

Scarlet Fever.—C. K. Millard (*British Medical Journal,* Aug. 16) deals with the etiology of return cases of scarlet fever. By "return cases" is meant cases arising from contact with a patient discharged from hospital. The latter may be called the "infecting case." Six weeks is the very shortest time after discharge during which return cases are to be so regarded. An unhealthy condition of the nasal mucous membrane, with or without nasal or oral discharge, appears to be of great importance, whilst desquamation appears to be unimportant in determining the infectivity of a case. Boobbyer first pointed out in 1896 that the fatality of return cases is above the average, and Mason, Niven and others have confirmed this. Boobbyer blames the "old hospital cases," cases which have been detained many weeks in hospital, for spreading infection of a more virulent type. Return cases used to be attributed to premature discharge, a view shown by Niven and Simpson to be incorrect. On the contrary, it is now being doubted whether prolonged stay in hospital may not actually lead to return cases by interfering with elimination of infectivity, or by heaping up extraneous infection, to be carried out by the individual. Overcrowding, independently of shortened stay, appears to increase infectivity as shown by return cases. Two views concerning the origin and nature of the infection carried home by the infecting cases are dealt with. Niven and Simpson do not regard the patient as infective *per se,* but rather as having infection engrafted on him, the infective matter emanating from an acute case being breathed in by the convalescent in the ward and stored in his nostrils to be subsequently breathed out at home. The infectivity of an aural discharge may be derived from that stored up in the recesses of the nose by way of the Eustachian tube. Dr. Millard's own view is slightly different. He considers that the belief that the infection of scarlet fever is eliminated by the skin is supported by little evidence and is "rapidly waning." The lungs and air passages are more probably the chief channels of elimination, and hence elimination of infection is likely to be retarded in an atmosphere charged with infection breathed out by other patients, and that therefore the patient on leaving hospital is infectious, *per se,* and not merely "charged" with extraneous infection. The second view is regarded as a corollary of the first, both being probably true. The scarlet fever germ, finding a suitable nidus in the nasal mucous membrane, may persist for long, its activity being related to the presence of a discharge, "whether causally or consequentially is not yet certain." The practical conclusions drawn from these considerations are that aggregation is wrong in principle, that true isolation should be substituted, and that great attention should be paid to the disinfection of the nasal cavities. Experiments on these lines are now being carried out in accordance with suggestions made by a special committee of the Royal College of Physicians to whom Professor Simpson's report was submitted by the Metropolitan Asylums Board. Similar attempts at disinfection with a fortnight's isolation only in special hospital wards, as carried out by Dr. Niven in Manchester, have, so far, led to no diminution of return cases, but the isolation period should be increased to at least four, and preferably to six, weeks. Dr. Millard's conclusion is that "the hospital isolation of scarlet fever, regarded as a preventive measure, has been a failure." E. D. Marriott considers, having regard to the number and gravity of return cases, that "the aggregation of the infective sick lacks the sanction of both science and experience." W. H. Line thinks the profession owes a debt of gratitude to Dr. Millard for his painstaking and courageous investigation of the effects of hospitalism on the spread of scarlatina, although he admits case mortality and complications have been reduced, and the type of fever appears milder than in the pre hospital days. S. Cameron considers that hospital isolation will continue necessary for the working and lower middle classes where home isolation is impossible. It is suggested that school authorities would in self-defence have to provide isolation if municipal authorities did not, so serious would be the interruptions to education in the absence of hospitals. Overcrowding in isolation hospitals is to be deprecated, and there should be also isolation for doubtful cases, whilst acute and convalescent cases should be separated. R. de Bovis reviews the history of traumatic scarlatina. It is forty years since English authors first directed attention to the occurrence of scarlatiniform eruptions in the subjects of operation or other wounds, the history commencing with the publication of writings by Sir James Paget and G. May in 1864. Since then the subject has from time to time been brought forward by Goodhart and Howse, in this country, and by Verneuil, Tremblay, Hoffa, Koch and others elsewhere. Hoffa classed many recorded cases as erythematous, drug, or transfusion rashes, or as other infectious rashes, septicemic, diphtheritic, etc., and only admitted six or seven cases as authentic. De Bovis has collected nearly 150 cases, of which only about 100 are accompanied by fairly full notes. Two-thirds of the cases were in males, and nearly 80 per cent. occurred in patients under fifteen. No special traumatism was concerned, septic and aseptic cases were alike noted. In over 50 per cent. less than three days intervened between the traumatism and the eruption; in 13 cases it was upwards of four weeks. Initial symptoms included fever, chill, gastro-intestinal disturbance, and sore throat, the last-named being milder than is usual in medical cases. The rash generally appeared within twenty-four hours, sometimes starting as a red ring round the wound, with red bands radiating to adjacent parts. Healing of the wound was generally retarded. Albuminuria was noted 16 times. The mortality was 9 out of 125 cases. Recrudescence of the rash two or three times occurred in two cases. C. H. Powers also mentions a medical case of scarlet fever in which the rash and other symptoms reappeared 14 days after the beginning of the illness. V. C. de Boinville reports a fatal case in which epistaxis and petechiæ occurred 15 or 16 days after the onset of the disease during apparently normal convalescence and desquamation. A case of purpura fulminans is also reported by H. Biss. The patient, a boy three years old, was convalescing fairly satisfactorily from a very severe attack of scarlet fever. On the eighteenth or nineteenth day extensive subcutaneous hemorrhages appeared, followed by hematemesis, rectal hemorrhages and death in 36 hours. Postmortem the kidneys were found almost entirely converted into fat.

Non-Epileptic Convulsions in Growing Children.—Lightly as people often regard convulsions in infants, the occurrence of apparently similar convulsive attacks in children who have left infancy behind them and have attained school age is very apt to be regarded as a manifestation of epilepsy and to be labelled as such, much to the detriment of the child. DR. EUSTACE SMITH (*Lancet*, Jan. 24, 1903) however, points out that convulsive attacks, similar to those that are so often seen in rickety or highly neurotic infants as a result of teething or other form of reflex irritation, may be found in children, even as late as the eleventh or twelfth year, being in them also due to pure reflex worry. The children thus affected are usually members of families which show distinctly neurotic tendencies, and are themselves highly strung, excitable, and easily moved to tears although by no means necessarily spiritless or timid. They may have suffered from convulsions during infancy, but often their special nervous susceptibility is of later origin, and seems to be quite independent of the rickety state with which convulsions during infancy are so often associated. Hence on the occurrence of convulsions in a growing child, it is most important before regarding such a case as one of epilepsy, with all its gloomy prospects, to consider carefully all the circumstances of the attack with a view to discover some exciting cause to which the seizures may be traced. It will often be found that there have been premonitory symptoms common to all the attacks, the patient having been for some hours or days before the seizure very obviously out of health. The seat of the trouble is usually in the alimentary canal, being often due to undigested or fermenting food. As a rule the attacks are separated by long intervals, during which the health, although perhaps not perfectly satisfactory, is fair. Sometimes the attack consists of a single seizure which is not repeated in the same bout of illness, while in other cases an attack may comprise many seizures, the whole group lasting several consecutive days, or even being spread over a period of weeks, then ceasing for a time to return again in the same way after a longer or shorter interval. The special feature of these attacks is, that they invariably coincide either with a digestive disturbance or with some other form of local irritant, and cease when this local condition is removed. Among the conditions which may conspire to produce these convulsive attacks may be mentioned adenoids, scybalous masses in the intestines, and eyestrain set up by hypermetropia or astigmatism. The great thing is to remember that these attacks are more allied to infantile convulsions than to epilepsy. If a child, whether he be or be not of known neurotic tendencies, begins to suffer from periodical fits, we must not too hastily assume that the case is a serious one, or that the patient is or is likely to become epileptic. If we are able to connect the seizure with a local irritant or passing derangement of organs we have reason to hope, and even to anticipate, that the removal of the disturbing influence may restore quiet to the nervous system. Instead then of flying at once to bromides and other nervine sedatives we should search without delay for the exciting cause and adopt prompt measures for its removal. Doubtless cases which ultimately develop the characteristics of true epilepsy do occasionally begin in the same way, that is in attacks occurring only when the health is deranged; but in the large majority of instances, where the fit occurs in a child who is the subject of a temporary digestive upset, we may reasonably expect that by judicious treatment the seizures may be put a stop to and the health be permanently restored. Many cases, Dr. Eustace Smith declares, warrant him in saying that young persons who have been subject to such seizures, even up to as late as twelve years old, may grow up into perfectly healthy adults without showing any sign of having suffered from a weakness which has long become a thing of the past. The importance of such a statement from so well known an authority is manifest.—(*Hospital.*)

Birth Paralysis of the Upper Extremity.—Birth paralysis affecting the upper extremity is now a well recognized affection which has been traced pretty definitely to injury of the motor nerve fibers which run in the anterior divisions of the fifth and sixth cervical nerves at their point of junction. Dr. ROBERT KENNEDY, Regius Professor of Surgery in the University of Glasgow, who has lately been repairing this injury by the early suture of the brachial plexus, says (*Brit. Med. Jour.*, Feb. 7) that in some way, during the birth of the child, tension or compression of the upper part of the brachial plexus has been caused with the result that the nerve fibers of the fifth and sixth nerves have had their conductivity destroyed. Some maintain that the lesion is caused by the compression of the nerves between the clavicle and the transverse processes of the vertebræ, while others think that the damage is caused by the nerves being crushed between the clavicle and the first rib. As a rule, he says, there is a history of considerable force having been applied during the birth of the child. In some cases after the birth of the head the finger of the accoucheur has been hooked into the axilla and considerable traction exerted; while in certain cases of breech presentation, or of transverse presentation in which turning has been performed, the arm has slipped up over the head and has required considerable force to dislodge it; or the body has been at the same time pulled upon in such a way that the head has been extremely rotated and bent to the side. In this way the nerves are overstretched, causing rupture of the nerve fibers or even complete rupture of the nerves themselves. Whatever may be the presentation, Dr. Kennedy is convinced that the chief factor in producing the lesion is forcible depression of the shoulder while the head is bent to the opposite side and rotated. On examination it is found that the arm does not take part in the usual active movements of the child, but hangs helpless. "It cannot be abducted at the shoulder on account of the paralysis of the deltoid and supraspinatus; the forearm cannot be flexed on account of the paralysis of the biceps, brachialis anticus, and supinator longus. The forearm is usually in extreme pronation on account of the usually present paralysis of the supinator brevis, and the entire arm is rotated inwards, so that the palm of the hand may be directed outwards, this being caused by the paralysis of the external rotators of the humerus (infraspinatus and teres minor), the unopposed action of the internal rotators thus bringing about the characteristic position." The treatment usually adopted in such cases is the use of massage, electric currents, and passive movement; and in certain cases the muscles recover. On the other hand the treatment often fails, the restoration being only partial, or no improvement at all taking place. There is no doubt at all that some cases recover without treatment, and it may be questioned whether the above-mentioned routine has much to do with the recoveries which take place under it. Supposing that the nerves are merely over-stretched, possibly with rupture of the nerve fibers within the sheath, the recovery is almost certain, while if the nerve trunks are completely torn across, although complete recovery is possible, recovery may fail completely or only take place partially. Moreover the same force which produced the injury to the nerves may have done other damage causing such cicatrisation in the neighborhood as to interfere greatly with the prospects of recovery. From these considerations Dr. Kennedy holds that the only rational way to treat such cases of birth paralysis is to deal with them just as injuries to the peripheral nerves in general are dealt with. As there is a possibility of spontaneous recovery taking place it is right to delay operation for a certain time to see if the developing electrical reactions indicate an approaching recovery of the muscles; but when this time has elapsed without sign of improvement there must be no further delay. Dr. Kennedy would not operate before the child is two months old. By that time it is possible to obtain good electrical contractions of the muscles by the faradic current. If these are obtained then the case ought to be left for a further period, and if after the lapse of another month good contractions are obtained with the faradic current in all the affected muscles, then the case may be expected to recover naturally. If, however, by the time the child is two months old no response can be got in the muscles by the faradic current, although of course the galvanic current evokes good contractions, it is safer to proceed with the operation than to put off in the hope that recovery may eventually take place. Dr. Kennedy has operated on three cases: one aged two months, one aged six months, and another, which must be placed in quite a different category, aged fourteen years. In the first infant the result was really good—a cure. In the second infant the result was very promising; while in the youth, as was perhaps to be expected, after so long a time, no benefit seems to have been obtained. Yet even in this most unpromising case there appears to have been some improvement in the electrical reactions, whatever that may presage in the end. The details of the operation for suture of the brachial plexus are interesting and should be carefully studied by any who propose to undertake the operation. It is evident however that as in other cases of injury to nerves it is well not to delay treatment, and this is a matter to be borne in mind by those who have opportunities for seeing such cases at an early age.—(*Hospital.*)

The Micrococcus of Acute Rheumatism.—We are told that at the present day it is hardly necessary to discuss the question of the infectiveness of acute rheumatism. The center of interest now moves forward to the question of the characters of the microorganism by which the disease is caused. Discussing this matter in the *Practitioner*, DR. AINSLEY WALKER begins by showing how, in its clinical and hygienic aspects, acute rheumatism presents all the characters of an infective illness. It is, he says, to some extent endemic in certain areas; it exhibits at times a tendency to epidemic prevalence; and it presents the stigmata of an attenuated septicemia. That it is due to an irritant circulating in the blood is evidenced by the occurrence of pyrexia, rapid anemia, erythemata and purpura, polyarthritis, pericarditis, myocarditis, endocarditis, often albuminuria, and at times pleurisy, pneumonia, and nephritis; and that this irritant is of microbic orgin is rendered probable by the frequency with which the onset of the symptoms can be associated with an antecedent pharyngeal inflammation, the familiar rheumatic tonsillitis. As to the nature and relationships of this microbe, Dr. Ainley Walker shows that one and the same microorganism is obtainable from acute rheumatism, from malignant endocarditis, and from chorea; and, on the other hand, that the organism isolated from a simple rheumatism may produce in animals malignant endocarditis, and probably at times chorea also.

Until lately, owing to the variety of organisms discovered by different observers, the tendency has been to attribute the disease to a variety of agents acting upon a particular type of tissue-soil, or to regard it as an infection by attenuated pyogenetic staphylococci or streptococci; while certain of its features were attributed to mixed infections. Attention has, however, of late been definitely centered upon an organism described by Apert and Triboulet in 1898, which has since been carefully examined by Paine and Poynton, who have found the organism microscopically in nearly all the lesions of acute rheumatism, and regard it as a specific cause of that disease. With this conclusion Dr. Ainley Walker, as the result of a re-investigation of the whole subject, agrees, holding that a particular microorganism and no other is the causal agent in the production of acute rheumatism. Whether, however, this particular coccus is merely an ordinary streptococcus or is something specific (on which hangs the whole question whether rheumatism is a specific disease or merely an attenuated streptococcic septicemia, as some hold), still remains unproven, although clinically there is everything and bacteriologically there is much in favor of its being specific. Once prove that the rheumatic micrococcus can be with certainty distinguished from all other streptococci, and we shall one the one hand possess a means by which rheumatism may be definitely distinguished from the vast array of conditions by which clinically it is imitated, while on the other hand the field will lie open for the discovery of some specific therapeutic agent by which the disease may be brought under control.—(*The Hospital.*)

Resuscitation of the Newly-Born.—Dr. HENRY T. DUFFIELD, Pittsfield, Ill. (*Medical Fortnightly*, Feb., 1902), says that in resuscitating the newly-born when there is asphyxia, great care should be taken not to over-do, and thus destroy what little life there may be present. The objections to many of the more common methods now in use are along this line, viz., of doing too much. For this reason I have for the past ten years been developing the following method which is both practical and serviceable and in my hands has enabled me, I believe, to save many lives:

First, grasp the baby as in Fig. 1, when you take it up from the bed (allowing the right hand to encircle the neck, with the shoulders resting upon the palm of the hand; the left hand grasping the legs. If there is obstruction in the air passages turn the head down (Fig. 2) (face down), and if the baby is vigorous enough give an up and down churning motion; this to aid gravity in clearing the throat. This may be supplemented by a lateral (side to side) shaking motion of the head, with the right hand which gives further aid in clearing the mouth. Then put the baby in position, as in Fig. 3, this will cause the liver, stomach and other abdominal contents to pull down the diaphragm, thus permitting and causing air to enter the lungs. Now reverse this position (Fig. 4), the weight of the same organs will push the diaphragm up and expel the air drawn in by the position.

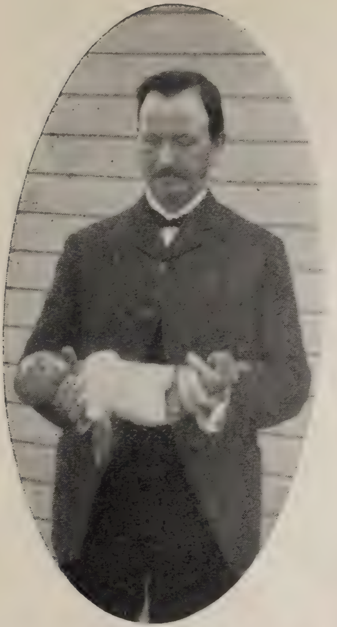

FIG. 1.

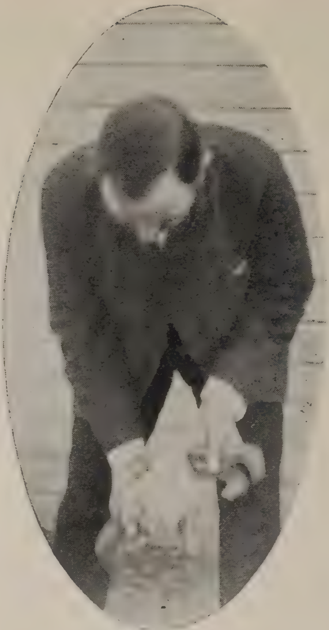

FIG. 2.

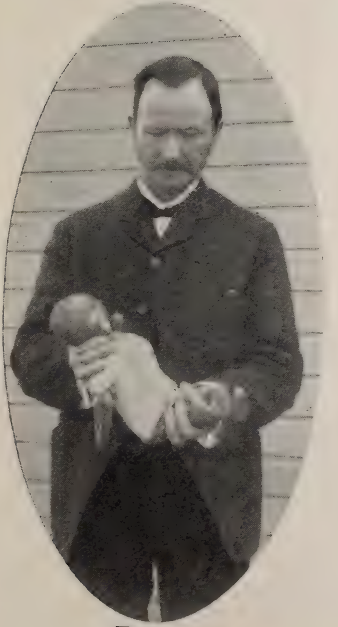

FIG. 3.

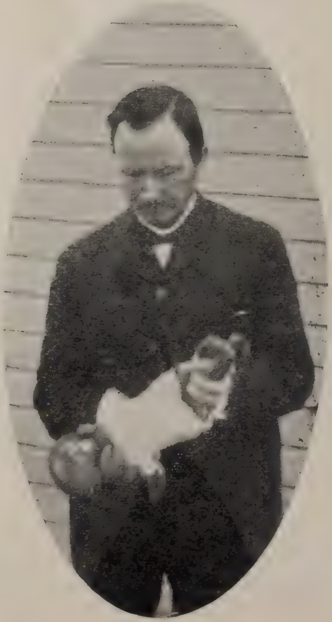

FIG. 4.

In placing the infant in these positions much emphasis can be given by a downward throwing motion, letting the buttocks strike against the left hand (Fig. 3), and then the shoulders strike right hand (Fig. 4).

Repeat these motions from ten to twenty times a minute, pausing occasionally in position of Fig. 4, to allow the brain to get the benefit of the increased flow of blood to it, and also to observe the heart's action. The fainter the spark of life present, the more delicate must be the manipulations, and here it is comes in the advantage of this method over all others in the ease with which the vigor of the manipulations may be controlled. Another advantage is that you can begin these manipulations before the cord is cut. (I have used it successfully before tying the cord.) It is well to have a basin of water as hot as can be borne by the hands, near at hand, so that the infant can be dipped in it, in order to keep up the natural heat.

Again a little cold water sprinkled upon the infant will by benefit of nervous shock, encourage respiratory efforts. In the majority of cases movements 3 and 4, if persisted in for a few minutes, will bring good results and without much trouble. The method is simple, easily learned, and in my judgment, a practical success.

Typhoid Osteomyelitis and Arthritis in Children.—M. FLORANGE (*Thèse de Paris,* 1902, No. 323) says that of all the infectious fevers typhoid is the most liable to produce osseous manifestations. But they occur only in about 1 case in 300. They are usually observed in patients below the age of 20, which may be explained by the physiological activity of the bone marrow in early life. They occur most frequently in cases of severe relapses and prolonged convalescence and in debilitated, scrofulous, and lymphatic children. Injuries have some influence in their production. Typhoid osteomyelitis occurs chiefly in the lower limbs, especially in the diaphyses of the long bones, the tibia being the most frequently involved. Of 14 cases in which the upper limbs were attacked the humerus was affected in 7, the ulna in 5, and the radius in 2. The other bones, such as ribs, clavicle, sternum, and bones of the hand and foot and the vertebral column are rarely affected. The lesions may appear at any time during typhoid fever; occasionally they occur during the first week but most frequently during convalescence between the sixth and eighth weeks. In some cases they have appeared several months and even years after the attacks. The typhoid bacillus is almost always present in the affected bone. It may be associated with other organisms. There are three groups of cases: (1) The typhoid bacillus is present alone; (2) It is associated with other organisms—the colon bacillus, staphylococci, proteus vulgaris, and some undetermined forms. The typhoid bacillus may subsequently disappear leaving only the other organisms. (3) The typhoid bacillus is not found, which has led to the suggestion by Fraenkel, Netter and others that all cases of osteo-periostitis in typhoid fever are due to secondary infection by staphylococci, streptococci, pneumococci, etc.

Typhoid osteomyelitis resembles ordinary osteomyelitis in that it is located near the epiphysial junctions. The lesions are circumscribed and do not tend to spread. The bone may be involved in its whole thickness, but the medullary layer is chiefly affected, then the intracanalicular and central marrow. The marrow is softened, congested, and under the microscope the fat has decreased while the cells have increased considerably in number. Necrosis may occur and sequestra form. The periosteum shows congestion and localized areas of swelling. Subsequently suppuration appears giving rise to yellowish or slightly blood-stained effusion beneath the membrane. Osteogenic changes may be excited in the subperiosteal layer, causing exostoses.

The symptoms are variable and may be divided into three groups—(1) diffuse subacute rheumatoid, (2) an acute localized form, (3) a chronic localized form. The rheumatoid form is the most frequent. In its slighter manifestations the symptoms consist of vague pains in the limbs which are increased by walking or the erect posture and disappear in two or three weeks. In such cases some increase in the height of the patient has been noticed. The temperature rises from 100 to 101 degrees. Some periarticular swelling may be noticed in addition to neighboring epiphysial pain and suggests an attack of acute articular rheumatism. The pains are worse at night and may last for weeks. The acute localized form usually begins during convalescence with vague constant or intermittent pains in a part of the limb, which undergo nocturnal exacerbations. Active or passive movements intensify the pain. In a short time a small swelling appears on the bone; there is pyrexia and suppurative periostitis may be discovered with fluctuation and edema of the skin. If necrosis takes place a sequestrum is eliminated in two or three weeks. The third form is chronic throughout, usually tardy, and is characterized by slight pain and general symptoms. A small swelling may be noticed which gradually enlarges. It may resolve, or suppurate, or lead to the formation of an exostosis.

The first form has been mistaken for neuritis or acute rheumatism. The chronic suppurative form may be mistaken for cold abscess. The absence of glandular enlargement and cicatrices, the character of the pus, and the different forms of organisms differentiate the condition from tuberculous disease. The osseous lesions of hereditary syphilis may give rise to some difficulty as the situation of the lesions, nocturnal pain and the production of exostosis are points of resemblance. In cases of doubt syphilitic treatment should be given a trial.

The prognosis generally is favorable. In three-fourths of the cases resolution takes place, and even the acute suppurative form may be cured in two or three weeks. In weakly children a fatal termination may result from exhaustion.

During convalescence from typhoid fever every care should be taken to prevent traumatism, fatigue, or undue movements of the limbs. Treatment is in the main surgical, and consists in opening collections of pus, and if necessary scraping suppurating foci.

The articular manifestations of typhoid fever are much rarer in children. Boys are more liable than girls; and the condition occurs most frequently at the end of adolescence—from 16 to 20 years of age. The predisposing causes are the same as for osseous lesions, and not uncommonly both the lesions occur simultaneously. Arthritic lesions may appear early in the fever, but like those of osteomyelitis occur more frequently during convalescence. The joints of the lower limbs, especially the hip, are most frequently affected. Bacteriological examinations have given variable results. Possibly in a large number of cases the joint lesions are secondary to epiphysitis. The synovial membrane is at first congested and thickened; later the ligaments give way; the cartilage becomes involved, and luxation or ankylosis takes place. The effusion may be serous or purulent. Clinically three forms may be distinguished. (1) Polyarticular serous, occurring early and affecting particularly the small joints and characterized by pain. (2) A monarticular form, chiefly appearing in convalescence and usually affecting the hip, and which proceeds to suppuration. (3) A late articular form, presenting the signs of infective arthritis, with rigors, irregular temperature, prostration, etc. Prognosis is favorable in (1), grave in (2), and almost hopeless in (3). The treatment is that of acute arthritis.

Anomalies of Revaccination.—ARTHUR MAUDE (*Lancet*, Nov. 1, p. 1190) says that the variations from the typical, both in local effects and in general disturbance, are wider in revaccination than in primary vaccination, probably because the variations of individuals are greater as they grow older. The literature of vaccination is enormous, but that of revaccination is scanty. The writer's conclusions are based on about 1,000 cases of revaccination with calf lymph. In revaccination the period of development of the vesicle is almost invariably shorter than in primary vaccination. In 75 per cent of cases by the second or third day decided itching and irritation at the site of insertion begin and the pain and swelling of the axillary lymphatics show the commencement of general absorption. The rest of the cases are divided between those of normal development and those in which maturity is deferred. In a few cases delay in the formation of the fully-formed vesicle is very great and the pocks are retarded for a fortnight or more. This occurs more frequently in elderly persons. Vesicles may recur two or even four weeks after revaccination. The writer has seen secondary auto-inoculation which occasionally takes place in the infantile arm and sometimes assumes formidable aspects. The new vesicles may be quite typical but they usually are abortive. They occupy exactly the same site as the original ones. In all the recorded cases the patients appear to have been young adults. In the writer's cases their ages varied from 18 to 35.

Raspberry Excrescence. In one instance the writer saw the condition described in America as the "raspberry excrescence" or "raspberry pock." Dr. T. Colcott Fox has described this complication in his own person (*Brit. Med. Jour.*, July 5, p. 35). The papule appears to be quite normal at from three to seven days after inoculation, but instead of becoming vesicular it remains hard, dense, bright red, and nodular, not unlike a small nævus. It is said by American observers to be very persistent, remaining weeks or even months; it may ulcerate from friction, and is followed by little or no scarring. It is said to afford no protection and to be evidence of a poor lymph. The writer's case corroborates this, as only one insertion assumed this form and the other three failed. The subject was a boy, aged fourteen, who had never been revaccinated. The condition disappeared spontaneously, in about a fortnight—the usual result according to Morrow, who described it in 1883.

Character of the Pock. In a large proportion of cases the vesicle is imperfect, acuminate, and irregular, and the resulting scab is small and imperfect, is shed early, and leaves much less scar than the primary vesicle does. Often a mere pink papule is produced, scarcely vesiculated at all.

Areola. The areola is due to secondary infection by micrococci. It is more common in revaccination than in primary vaccination because the ordinary infant's skin is better washed than that of adults, and the epidermal layers are thinner and less favorable for the growth of streptococci. In the numerous cases in adults without any areola there are acuminate scabbed pocks in which the scab completely protects the ill-developed vesicle below. When a very potent lymph is used the resulting scab is often hard, leathery, black and prone to ulcerate freely underneath. This may occur without any excess of areola or other evidence of micrococcic infection, primary or secondary, and is due merely to the intensity of the specific itching in the skin. Intense itching usually occurs at the seat of inoculation during the first few days, before any marked pock is produced. There is some specific quality in this, for so long as the writer in his own person could get any local reaction from vaccination the places used to itch; when he could not they itched no more than an ordinary scratch. Pain and swelling in the line of the lymphatics often follow within three days, and before the full development of the vesicles. From overuse of the arm a considerable lymphangitis frequently results and may even invade the lymphatics of the chest wall, when adenitis and periadenitis of the axilla are severe; but the writer has never seen suppurative adenitis follow, and it appears to be almost unknown.

Constitutional Symptoms. These are more severe than in infants. Higher variations of temperature occur in revaccination. There may a temperature of 103° lasting 48 hours, accompanied by intense headache, general aching, sickness and malaise. In some delicate women vaccinia produces great epigastric pain, sickness, and intense lumbar pain, and diarrhea may rarely supervene.

Boils. Recurrent attacks of boils have followed revaccination in persons previously not subject to them. In the writer's cases the patients were otherwise healthy young adults, cleanly, well fed, and florid. The boils are produced by growth of staphylococcus pyogenes (aureus or albus) in the crust of the original scab, which becomes transplanted to the skin elsewhere and cultivated in the usual rotation of boil crops. The infection may last months and even a year. In most cases there is no suspicion that the staphylococci are present in the lymph, as the infection arises much too late.

Rashes. Eruptions due to pure vaccine inoculations are commoner in revaccination than in primary vaccination. Urticaria, erythema multiforme, wandering erythema, a generalized roseola resembling measles, occur before the development of the vesicles—in the first five days—and are common in adult females. They seem to depend on some personal idiosyncrasy and are comparable to the rashes produced by diphtheria antitoxin (*i.e.*, by horse serum), tuberculin, and numerous drugs. Psoriasis is a rare sequel of primary vaccination, for psoriasis is very rare in infants at all. It is, however, in adults a not infrequent sequel of revaccination. But cases of psoriasis have arisen in the course of the vaccination process. The writer has seen only one case of the generalized vesicular rash of vaccinia—in an elderly man. There was a single crop of small papules becoming vesicular and, about the fifth day after insertion, dying away in scabs. The pocks resembled small vesicles of varicella and were situated on the limbs. There was no unusual constitutional disturbance.

A Case of Banti's Disease with Diffuse Productive Nephritis.—Field (*American Journal of the Medical Sciences,* March, 1903) reports an interesting case of Banti's disease, with diffuse productive nephritis. He first calls attention to the fact that there are four pathological conditions resembling each other, to three of which his case presented considerable similarity. These conditions are: 1. Banti's cirrhosis, or Banti's disease. 2. Cirrhosis of the liver, with secondary enlargement of the spleen. 3. Splenic anemia. 4. Primary spleno-megaly of Bovaird. After giving the history of his case and the result of the findings at autopsy, he discusses at some length the lesions found, paying especial attention to the question of differential diagnosis and the determination to which of the four groups previously mentioned his case belonged. His conclusions are as follows: 1. There are four conditions, more or less closely related, which may be distinguished as follows: Enlargement of the spleen, with anemia and the later development of a cirrhotic process in the liver, may be separated from cirrhosis of the liver, with secondary enlargement of the spleen, by the fact that in the latter condition the spleen never attains the size that it does in the former. Both these conditions may be separated from splenic anemia and primary spleno-megaly by the presence of the cirrhosis of the liver, while these two latter conditions may only be differentiated from one another after a microscopic examination of the spleen. 2. The case here reported should be placed among those cases termed "Banti's disease" for three reasons: (a) The very great enlargement of the spleen; (b) the presence of a cirrhotic process in the liver; (c) the fact that the enlargement of the spleen was due to a general hyperplasia, but more especially of the connective tissue. 3. The present case, exhibiting an advanced chronic productive nephritis, somewhat extends the scope of the pathological anatomy of Banti's disease. Speculation as to the etiology of the disease seems at present premature, but the increasing recognition of the occurrence of transitional cases connecting together Banti's disease, splenic anemia, and diffuse cirrhosis of the liver suggests an origin from a common cause emanating from the gastro-intestinal tract. —*Maryland Medical Journal.*

PEDIATRICS

Vol. XV. JUNE, 1903 No. 6

ORIGINAL ARTICLES

DISLOCATION OF ONE HALF OF THE FRONTAL BONE DURING PARTURITION

By Stewart LeRoy McCurdy, M.D., of Pittsburg, Pa.,

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Quite an unusual case was referred to me by Dr. I. J. Moyer. It is plainly a dislocation of the right half of the frontal bone. The force producing this rare dislocation was applied during parturition.

Ossification of the frontal bone begins at about the eighth fetal week and is not completed for several years after birth.

The *metopic suture,* or that between the halves of the median line, not infrequently remains open through life. At birth there is nothing but membranous attachment throughout the circumference of the frontal bone, so that force applied to the head as it passes through the pelvis straight in lateral frontal presentation could very readily result in just such an accident.

The child was several months old when I first saw it. It was not thought possible to restore the margins of the bone to normal relationship by any method. Immediate force would have the

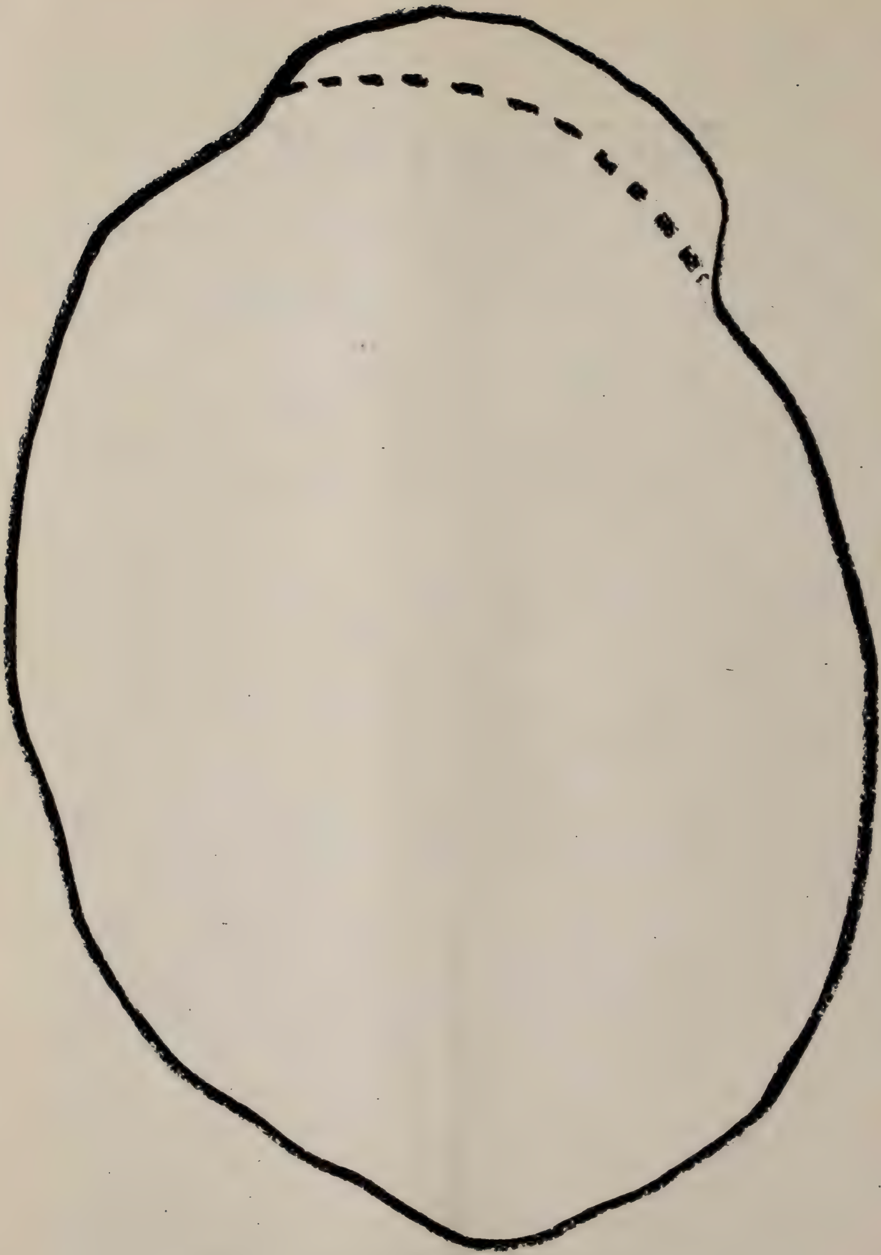

Fig. 1.—Outline of the head showing dislocation.

same effect as it would in distorting a normal skull at the same age, resulting in injury to the brain without replacing the bone.

The only means that suggested itself was to use a spring band about the head with a pressure pad resting upon the frontal eminence. By gradually increasing the force it was hoped that some good might be accomplished. As a matter of fact, however, very little was accomplished toward reduction. The child is very bright, well nourished and in every way normal. The brain has conformed itself to the new cranial wall so perfectly that its functions are being performed perfectly.

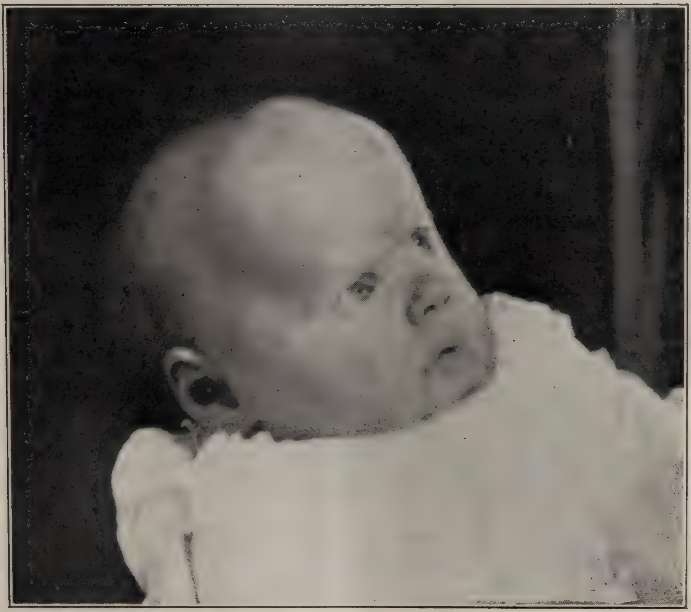

Fig. 2.—Photograph of patient showing dislocation.

ADENOIDS AND THEIR TREATMENT*

By J. F. Dickson, M.D.,

PORTLAND, OREGON

In preparing a paper on adenoid growth—a subject with which, no doubt, you are already quite familiar—I do so for the purpose of calling attention to one complication or result of this disease, to which I fear the notice of the profession in general has not been strongly enough directed. I allude to the effect on the hearing. How these growths affect the auditory apparatus is still a mooted question. Some say by causing a swelling of the mucous membrane at the mouths of the Eustachian tubes and so closing them, or by the growth itself blocking them or obstructing venous circulation and so producing passive congestion of the Eustachian tubes—others by an extension of catarrhal inflammation up the Eustachian tubes to the middle ear, thus setting up an acute otitis resulting in suppuration and perforation of the membrane, which may become chronic and last for years in spite of all treatment; or a chronic non-suppurative condition, causing retraction and eventually more or less sclerosis of the ear drum, besides impairing the mobility of the ossicles and all the other morbid conditions that follow such inflammations in the middle ear.

Bosworth thinks it due to the mouth-breathing, which does not allow a free current of air through the vault of the pharynx, consequently the air in the middle ear is not changed as frequently as should be, thus becoming rarified and causing hyperemia of the mucous membrane, which finally results in catarrhal inflammation. Whatever the proper theory may be, the fact remains that these growths have been demonstrated to be the cause of over 70 per cent of the cases of ear trouble in children.

Meyer's statistics give 74 per cent; Blake's 83 per cent, Barrett's 80 per cent, and Kyle's 90 per cent. With such a large percentage of grave ear diseases due to this condition, it behooves us to become more fully cognizant of its causes, symptoms and treatment, so that we can more intelligently and thoroughly treat and

*Read before Eastern Oregon District Medical Society.

permanently cure many a case of ear trouble which heretofore has been considered incurable. Of deaf mutes (Frankenburg, 158 cases), 59 per cent had adenoids.

As I have already said I do not think importance enough has been given this trouble by the profession in general, and the advice "he will grow out of it" is, I am afraid, too often used. Do not misunderstand me, and think I recommend operative measures or treatment to the naso-pharynx in all cases of ear trouble. I do not, but in cases where any impairment of hearing exists, with symptoms of adenoid growths, or where there are recurrent attacks of earache, frequently followed by suppuration; or obstinate non-suppurative or old chronic suppurative cases, with offensive discharge that does not yield to any treatment, or, in fact, any pathological ear condition for which the cause is not readily found, the naso-pharynx should be thoroughly examined for adenoids, and if found, the physician's duty is very plain, viz., to treat—and that very thoroughly—the naso-pharynx as well as the ears.

There is no doubt that removal of adenoid growths frequently results in prompt and permanent cure of offensive middle ear discharges, and the explanation is probably found in the fact that the rarified air (due to closing or blocking of Eustachian tubes) causes hyperemia of mucous membrane leading to hypersecretion and this, in a closed cavity, may be converted into pus. Neither can there be any doubt but that non-suppurative inflammation of middle ear occurs in a large majority of adenoid cases, but it does not always stop at this—often going on to suppuration and all other evils which usually follow.

If, in the ear cases in which adenoids are found, or in other cases where they are large enough to cause marked general symptoms without involving the ears, treatment without removal will generally prove very unsatisfactory, in all probability only giving temporary improvement in the first case, and a very strong possibility of ear trouble being set up sooner or later in the second.

Adenoid growths of the naso-pharynx (or adenoids as they are more generally called), or, to be still more explicit, chronic hypertrophy of the pharyngeal or Luschka's tonsil, are a much more common pathological condition than is generally supposed. The question is often asked if these growths are not much more frequent than in former years. I do not think so. We search for, and recognize them more readily, and thus an apparently greater number of cases are found which formerly were overlooked. In fact, I am inclined to believe that on the Coast almost every child has them in a greater or less degree, and if one chose to be radical very few children would escape operation. My experience has been that in the majority of cases of enlarged tonsils there is also adenoid hypertrophy, and in this may be found the reason why removal of tonsils only, so frequently does, or rather did, not give the relief hoped for. I never do a tonsillotomy without exploring the naso-pharynx as well. It consists of a true hypertrophy of the normal lymphoid tissue found in the naso-pharynx and, histologically speaking, presents little or no difference from that seen in hyportrophied faucial tonsils except that in the latter one sees more connective tissue.

This, however, is accounted for by the fact that the faucial tonsil is constantly subjected to pressure and irritation by contact with food and other matters and necessarily gains greater firmness. It is almost invariably a disease of childhood (generally about third, fourth or fifth year of age) often being seen in infants, and I lately operated on a child four months old. It is about equally divided between the sexes. Like other glandular hypertrophies it shows an apparent tendency to atrophy, or to disappear during or after adolescence, and it is due to this tendency, no doubt, that the advice to "let the patient grow out of it" is often given. In the majority of cases, however, before the patient has grown out of it permanent impairment to hearing has taken place, or the general health suffers, and it is only when symptoms of post nasal and nasal catarrh, mouth-breathing and deafness apper, that a physician is consulted.

The apparent disappearance of these growths also is often due to the pharyngeal vault enlarging, thus giving more room and causing the general symptoms to abate, but the growths themselves remain as great as ever, and do as much mischief. The chief site of the growth is the posterior wall and roof of the naso-pharynx, and it varies in size and shape, being in the majority of cases a soft, irregular spongy mass, sometimes smooth and more generally rough and fissured. Symptoms of this trouble are, as a rule, well marked, many and varied. Excessive nasal discharge poured out by the diseased glands is very common and in most cases makes its way down into the pharynx, causing continual hawking and spitting. In young children, owing to inability to blow the nose, it tends to block the nostrils. Mouth breathing, noisy respiration during the day and snoring at night are also symptoms, and frequently the ones which cause the patient to seek relief. It is more marked at night, and often so bad as to keep others in the same room awake. Cough is often present, due to laryngeal irritation caused by the mouth breathing, and possibly, too, by the secretions making their way down into the pharynx, and I have often noticed that children with this trouble are more susceptible to croup.

Night terrors are often present; children sleep uneasily, toss about, moan and frequently wake up crying, frightened at something, they cannot tell what. This is probably due to the tendency we all have to breathe through the nose, consequently enough air is not taken into the lungs to purify the blood, deficient oxygenation to the whole nervous system results and a mild convulsion follows, the sufferer generally waking up enough to fill the lungs with air by breathing through the mouth and then, as it drops off to sleep again, the cycle is repeated.

Certain reflex symptoms, such as sweating about the head and shoulders, asthma, stammering and even incontinence of urine have been noted. Recurrent headaches, especially in the morning, are not uncommon. The voice is generally more or less affected, being in marked cases very nasal in tone; and there is inability to pronounce m. and n.

In singers the voice is often much affected, not on account of any primary disease of the larynx, but the effort produced in taking the head notes overtaxes the larynx and eventually results in chronic laryngitis.

One of the most pronounced symptoms is the peculiar facial appearance that is often seen and is frequently so marked as to enable one to diagnose at a glance. The open mouth causes the folds between the nose and upper lip to become less distinct (or perhaps obliterated) the inner canthi of the eyes are drawn down, the bridge of the nose often broadened, and the expression thus becomes vacant and stupid. This appearance, when accompanied with impaired hearing and consequent inattention on the part of the sufferer, has given rise to the opinion that such children are lacking in intellect. Operative measures have disproved this idea, however. The roof of the mouth is often highly arched, resulting from mouth breathing, and children suffering from this trouble are frequently pale, sallow, badly nourished and poorly developed and very subject to taking cold. Treatment in the tonic line has little or no effect, but an operation is often followed by a surprising improvement.

With regard to causation, heredity, I think, plays a prominent part—one often sees it in several members of the same family. Frequent colds, whooping cough, scarlet fever, diphtheria, measles, scrofula and nasal catarrhal conditions also cause it.

Diagnosis in the majority of cases is comparatively easy. The mouth-breathing, snoring, facial expression, catarrhal discharge, etc., are often sufficient. If there is any doubt, however, examination with the rhinoscope will always decide. Anteriorly, nothing positive as a rule will be seen, but if the mirror can be used so as to give a view of the naso-pharynx a reddish gray fissured or smooth mass will be seen, more or less completely blocking the space.

The growth, of course, varies greatly in size and appearance, but the description just given will be sufficient to give one a general idea of it. Often, however, it is impossible to use the mirror, when other means have to be resorted to. In such cases, depressing the tongue and looking at the posterior wall of the pharynx will frequently reveal a number of small raised follicles, often connected by small, raised reddish lines. While this appearance is not to be considered pathognomonic, one is quite safe in using it as a corroborative sign. Absence of the follicles does not necessarily mean adenoids are not present, but their presence in the majority of cases indicates they are.

Bosworth recommends an oily nasal spray, and I consider it another good corroborative test. Failing in all those, digital exploration is the only means left. I never employ this method except as a last resort, as it is disagreeable and often painful to the patient, and, besides, a very unsatisfactory one to the novice. The finger should, of course, be thoroughly aseptic, well oiled, guarded with a rubber band or other covering to prevent its being bitten, then passed carefully up behind the soft palate. It is impossible to give an exact description of what to look for, but one must remember that the growth, in the majority of cases, is to be found on the posterior wall and may feel like a firm projection (more common in the older children) or a soft worm-like mass. Bleeding frequently results, and is by some considered proof of their existence, but I do not think it positive.

Prognosis with regard to removal of growth, disappearance of symptoms and improvement of general health is good. The change for better is often surprising. There is, however, a tendency to recurrence in a small percentage of cases, with a return of the symptoms, but as a rule in a much modified form. It seems as if this tendency were greater on the coast than in inland districts, but I cannot speak positively in this regard. It may be due to imperfectly done operations, but I do not think this will account for all the cases.

I have already said that these growths show a tendency to atrophy in the adult, and hence the question of treatment is a much argued one, many writers advocating that they be left alone on that account. It is not uncommon to see large adenoid masses in the naso-pharynx and yet the patient suffers no inconvenience whatever, both parents and child being unaware of any such trouble. In such cases it is hard to know what to do. A postponement is often wise, but the child should be carefully watched and the treatment begun as soon as any symptoms become manifest. Remember, the growths are always a menace to the hearing, and I think even where no ear trouble shows itself in childhood they may nevertheless be a prime factor in causing deafness in the adult. On the contrary, small growths often produce very distressing symptoms. I still reiterate, however, that should the patient show any defect in hearing, or any tendency thereto, or should the general health become impaired, the question of treatment should be considered decided at once. Treat, and without delay.

Treatment of this condition may be described under two heads —nonoperative and operative.

When the growths are not very large, and are soft and friable, treatment directed to the nose and naso-pharynx in the shape of alkaline sprays, followed by direct application to the growths of solutions of tannic acid and glycerine, or iodine and glycerine with internal medication, such as syr. ferri. iod. or syr. hydriodic acid, tonics, etc., will sometimes be all that is required.

If, however, the growths are large and hyperplastic, operative measures will be necessary.

There are various methods of operating, and each has its enthusiastic advocates. Bosworth prefers the galvano cautery introduced behind the soft palate cold, and after the point is in contact with the growth, as is shown by the throat mirror held in the other hand, the current is turned on the growth freely. He also recommends the snare cauterized, the point withdrawn cold. Chromic acid and silver nitrate may be used in the same manner, only they must be applied on a guarded applicator, or the operator will often get a much greater effect than he desires. The reaction after these applications is generally considerable, and they are often quite painful. I do not use them much, only in cases where patients object to cutting, as I do not think they have any advantages over other methods, are much more tedious and, besides, require considerable skill.

If a cutting operation is decided on it is better to use an anesthetic, unless the patient is old enough to control himself and bear the discomfort and pain, when cocaine can be used. Lowenberg's forceps, which are curved to admit of their passage up behind the soft palate, or any of the various modifications of them, are the best all-around instrument to use. Meyer uses a ring-shaped curette, both straight and curved. Gottstein advises a heart-shaped curette, which is passed up behind the soft palate and the whole growth removed at once. It has proved very unsatisfactory in my hand. Nearly all operators use the finger nail during the operation, and some exclusively. Others put a steel nail on the finger, with which they scrape the growth off. It is, in my opinion, a dangerous instrument.

In regard to anesthetics, I prefer ether first, chloroform next; have good results with bromide of ethyl, but it requires very quick work. Nitrous oxide is of too short duration for good work; local anesthesia for older patients only, but as a rule we are not able to do such careful work with it in operating on young children.

Whatever instruments are to be used, the patient should be placed on his side, with the face turned forwards over the edge of the table, so as to permit the blood to run freely out of the mouth—or else laid on the back, with the head hanging over the end of the table, this latter position being the favorite one with English surgeons. As a rule, I prefer the first position, and generally begin the operation with the curette or forceps, removing all I can scrape or grasp with them, then I introduce the finger and thoroughly scrape the sides and back of the cavity until all is removed. Sometimes it may be necessary to use the forceps again, but I have not had to do it often. The operation is a bloody one, but I have never seen a case of hemorrhage yet. Immediately after removal of growths the nose is douched by hot alkaline antiseptic solution, and some operators advise that this be kept up every few hours for the first day or two, but I have not found it necessary generally; it is a good rule in adults. As a rule the patient does not suffer much from the effects, and in a few days has apparently recovered. After-treatment, in the shape of sprays, etc., should be kept up for a few weeks after the operation, as it helps to prevent recurrence.

The good results of the operation are generally noticeable within a week or ten days, and, as I have said, the improvement is sometimes surprising. As soon as the naso-pharynx is thoroughly healed treatment should begin to the aural condition if any is present, but not before, as septic matter may be forced into the middle ear if the Politzer bag be used.

THE CHANGES IN THE MANAGEMENT OF LARYNGEAL DIPHTHERIA TREATED BY INTUBATION

By Edwin Rosenthal, M.D., of Philadelphia, Pa.

So many changes have taken place in the method of treating diphtheria, and especially that type known as diphtheria of the larynx or membranous croup, that a paper on this subject can never fail to interest, and might in some measure instruct. This class of cases, that formerly were considered the most fatal type, and which by reason of their gravity were dignified with a special name—croup—should always be considered the specific factor that prompted the investigations of the bacteriologists resulting in Behring's heil-serum as the specific treatment; and in a specific operation, that of intubation. Medicine, as well as surgery, can give no better example of the progressive strides of the zealous investigator than the discovery of the specific diphtheritic bacilli and its antidotal treatment, for the one, and the evolution of the intubation tubes for the other. Even as the discovery of the origin and cause of the disease resulted in the discovery of the remedy, so the study of the various types and manifestations of the malady resulted in the various methods to meet them. Whilst the treatment of the disease is most modern and belongs to the latest school of investigators, the study of the treatment of the symptom "stenosis" may be termed an ancient one, and is linked with the history of medicine.

Very many methods have been devised to combat this condition, but, to briefly summarize, only two have remained—tracheotomy and intubation—as a certain method of treatment. The choice of either operation was mostly the experience of the operator until the advent of the serum treatment, when the one, the operation of tracheotomy, has been replaced by the operation of intubation, and now we can safely assert that intubation of the larynx should be the only operation for the relief of this kind of stenosis.

In one of my earliest papers on this subject ("A Report of 100 Cases of Diphtheria of the Larynx treated by Intubation," *Medical Bulletin,* September and October, 1894), I made the following observation as helpful in determining the choice between Intubation and Tracheotomy:

"1st.—To intubate always, when no professional assistance is at hand, no matter what the age of the patient.

"2d.—Under the age of four years, always to intubate.

"3d.—Between the ages of four years and seven years I should intubate primarily, and do tracheotomy secondarily.

"4th.—When I suspected loosened membranes or the spread of the disease into the trachea, I should perform tracheotomy.

"5th.—In the class of cases met with, in the poorer people, when skilled attendance can hardly be obtained, intubation should always be done."

Whilst these indications still hold good, and should not be disturbed, the specific character of our remedial agents are now a factor to be considered, and enter largely, as an indication.

For this reason, and with an intimate knowledge of the method of using the serum, as advised by Behring, and the results obtained from the judicious and exact way, I would modify these indications by summarizing thus:—

I would intubate in every case, no matter what age, or what time of the disease, and only tracheotomize when the intubation tube either is too small and does not penetrate entirely the seat of the obstruction, or where the membranes, either loosened by the use of the serum (beginning to disappear by degeneration or the like) are pushed ahead of the tube into the trachea.

The advantages and disadvantages which belong to intubation, and which were also factors in deciding the choice of operations, have remained the same. These briefly are:

The advantages:

1st.—The speed with which it can be performed.

2d.—Bloodlessness.

3d.—Lack of shock.

The disadvantages:

1st.—It clouds the prognosis.

2d.—The tendency to heart failure.

3d.—Its dangers—pushing down false membranes; suffocation by the finger in attempts to intubate.

4th.—The difficulty of nourishing the patient.

5th.—The difficulty in deciding: When shall the tube be removed?

During the last eight years, it has been my endeavor to investigate the "disadvantages," and to see by what manner or means we could combat these objections, and if possible, utilize them, or place them in the list, where either one or all could be of some value. For this purpose, I have from time to time presented various papers on this subject, and whilst the field of study is rather a large one, and the opportunities rather limited by reason of the lack of material, other operators, notably Johan Bokai, of Budapest in Hungary Austria, Fisher of New York, Waxam of Denver, Dillon Brown of New York, Francis Huber of New York, Simpson, Cheatham, Massei, Rosenberg, Trumpp, and others equally as zealous, have undertaken the same task, and the results of our labors have given us a clearer conception of this operation, and a clearer insight of the various accidents, complications and sequelæ, that have been met with and that have been classed as disadvantages to this operation.

Hence in the various opportunities that were mine, the specific symptoms were investigated, and remedied if possible.

The results have been most surprising, and in none so gratifying as in the "after-treatment" of any given cases. If I quote again from my paper of ten years ago, I do so simply to show the change in my method of treatment, for in this change, not one rule or method pursued in that distant time has remained with me. If I were to treat a case now as heretofore, I would consider my work superfluous, and if ten years ago, I were to treat a case, as I do so now, I would fear that my work would be insufficient, neglectful or of no value. As this change in the after-treatment is so different, I will quote from my former papers:

"After intubation, as soon as practicable, I give the child to drink, water, milk, wine, or anything. I permit the child to hold the glass or cup, and do as it pleases. Generally the drink causes coughing, and mucus and membranes are frequently brought away."

At the present time, this technic remains unaltered. I might add however that, for the purpose of intubation, I use a solution of peroxide of hydrogen. This I use by means of an atomizer. My purpose is to lubricate the upper air passage with the froth that the peroxide engenders. I use this rather copiously at this time, and I even permit the tube to lie in the same solution until I am ready to use it. Immediately after the intubation I still use the spray, thus, by its means, I endeavor to thoroughly clean the throat, larynx and parts within reach.

Now, where I formerly directed that this spray be used hourly, simply as a matter of routine, though my object is to thoroughly cleanse the throat of any infecting germs, I now only use it when indicated. This I shall mention further on in this paper.

Now, in former times, when medicines were used empirically for this disease, I would direct their use at such frequent intervals —as hourly, perhaps—that the after treatment became a constant treatment, and it appears now to me as if it was a constant work, from the application of the atomizer to the food, to the medicine, to the inhalations (for the inhalation of slaking lime was one of the specially pursued treatments) of steam or the like.

Let us quote again: "Lime inhalations I have found of questionable benefit. I have used it in cases that have recovered, and also in those that have died. A piece of unslaked lime is placed in a clean bucket with some cold water; the steam as it arises is brought to the child lying beneath an improvised canopy, made of an open umbrella and sheet." "These inhalations are used judiciously, about once every hour, and are continued for about fifteen minutes."

By these quotations you can judge how onerous was the treatment of a given case of laryngeal diphtheria when intubated. And the mortality records were being reduced. Indeed, we had reached 68 per cent, when the serum treatment came as an aid to prove the real utility of the intubation.

What now is our method? This brings me to the title of my paper: The present management of a case.

It is mainly due to the specific action of Behring's diphtheritic heil-serum that the changes in our treatment are due, and the after treatment in each case is inseparably interwoven with the use of the serum. Hence with a knowledge of how the serum will work and does work, the operation for the relief of the stenosis has become an exact one. Analyzing the various cases as we meet them, I have learned to look upon this special type of the disease as a twofold one, and in my operative procedure, adapt my methods to whichever the case presents. These types I call a Primary Type, or the so-called membranous croup, in which the disease begins primarily in the larynx; and the Secondary Type, or the so-called "true diphtheria of the larynx," in which the disease begins as a faucial, nasal or tonsillar diphtheria, and extends to the larynx, by the contiguity of the membrane.

Again, we have the disease as appearing secondarily to, or a complication of, another infectious disease, such as scarlet fever, measles, whooping cough, typhoid fever, or the like, and where it appears as a complication to another infectious disease, it is well to place it in the class of the secondary type, and treat it accordingly.

Much depends whether the type be primary or secondary, in the choice of my method of procedure. By this I mean: Whether to inject the serum and wait with the intubation, or whether to intubate first, and then use the serum, or whether to intubate, and first use other means, as the injection of strychnine, saline solution or the like, and to leave the question of specific treatment in abeyance, to the present imminent danger from death.

I might add that the most of my cases are seen in the practice of others, hence I am most generally called when the case is very far advanced and when the operation of intubation is an urgent one. The question of the use of Behring's heil-serum being no longer a debatable one, it may have been used, or I may use it, at the time of intubation.

Therefore the diagnosis of the type bears greatly upon the treatment with the serum, and influences to a considerable extent the question of the prognosis. As an example:

If a primary case be seen so late as to require intubation, it may be, and in most cases, will be, early enough to be influenced by the serum treatment. The danger in these cases is mostly due to the stenosis; this being relieved, and the diphtheria treated with the serum (no matter how late—provided the disease still be in the larynx only) even if it be on the 5th, 8th, or even the 10th day, a favorable prognosis can be given, and the tube be removed on the 5th day after intubation, and remain away. The explanation of a case like this is: The larynx is devoid of lymphatics, there is very little infection of toxemia, the serum used is sufficient to neutralize this, and the case should then get well.

If such a case of primary laryngeal diphtheria be seen early enough, by that I mean in the first two days, and the serum be used in sufficient dosage, the case will in all probability get well at once, and intubation be not required.

Now then the secondary case. You have heard all the evidences of diphtheria, either faucial, tonsillar or nasal. How then should we proceed, when the larynx becomes invaded?

Here the picture is vastly different, the danger in cases like these is not so much the "stenosis," as the "toxemia." These cases are happily at this later day very rare. The diphtheria serum treatment is now sufficiently well known, and so universally, and I might add "empirically"—so used, that this particular type of laryngeal diphtheria is an exception. However in cases like these even when the stenosis is not very well marked, intubation should be performed at once. Why? The progressive type of the disease always reaches to that point which is beyond that in which life can exist, by reason of the suffocation which results from the progressing membrane, and if relief to this be not given at once the patient, though obtaining a sufficient amount of the specific heil-serum, may not live long enough (from 72 hours to 120 hours) for the serum to do its work. Hence in all cases of secondary diphtheria of the larynx, intubation should be performed at once, or at the earliest possible need, thereby saving time, and seizing the opportunity of the greatest good.

When diphtheria of the larynx comes as a complication to measles or the like, and the symptoms are not recognized early enough (that is, on the first two days) when a sufficient amount of the serum can be given, even as an immunizer, then should intubation be performed at once; for the progressive method of the secondary type belongs here, and the case may progressively become worse, as regard the stenosis, before the serum will get in its work.

With these rules, when to intubate, as a guide, I shall now proceed to the management of the case:

I take it that you have all become familiarized with this operation, therefore to describe its technic would be superfluous. We will say that we have just intubated a case. Now the questions to be answered are:

1st.—Have you intubated correctly?

2d.—Can you leave the case safely, or until you will return?

3d.—What shall be the medical treatment of the patient?

4th.—How feed the patient?

To the first question the patient's condition will be a sufficient answer. If you have succeeded in placing your tube correctly there will be at once a whistling sound followed by a cough. The child will attempt by coughing to dislodge the tube. Now always use a comparatively new tube. These tubes are always prepared in the same way, thus: When I receive the tubes from the hands of my gilder, I boil them for a short while in sterile water and place them in sublimate cotton until to be used. When I use them, I place them again in boiling water and then previously to the intubation, in a solution of peroxide of hydrogen.

Now, then, to proceed: As a means of intubation, I invariably use a spray of peroxide of hydrogen. This by means of an atomizer I throw into the mouth, on the tonsils, into the pharynx, over the larynx, and indeed at every point in the throat that I can reach. This solution, as you all know, makes a rather thick lather; this lather I use as a lubricant, to make my tube slip easily in place, and also to prevent the accident of pushing down the loosened membranes or the like, experience having proven to me that only when the parts are very dry and difficulty is met with the tube engaging or entering the larynx, do these accidents occur. Using the solution of peroxide reduces this danger to a minimum, so that the peroxide has real value in this operation. After the tube is in place, I may use this spray several times in succession, or until I hear the air enter and leave the tube in a normal manner unimpeded. I then cease using my spray, and give the patient to drink of a stimulant or the like, and after I am satisfied that the tube is correctly placed and that everything regarding it is in perfect order, I then consider the next step: Can the patient be left alone or with such help as is not considered trained? This each case must decide for itself. Generally, if an hour elapses, the child rests easy, the air enters and leaves the lungs unimpeded, the condition of the child showing that the blood has become again filled with oxygen, and the danger from suffocation passed; the child can be left safely for any number of hours that the after treatment may require. This now brings me to the medical treatment, and what shall it be?

The medical treatment depends upon the type met with, that is, whether it be a primary or secondary, or whether it be a diphtheria pure and simple, or a complication to another disease.

I might summarize these observations briefly thus:

The serum treatment of diphtheria having resolved itself into a "specific" treatment as regards the cause, each and every case, no matter what may be its type, whether a primary or a secondary, a complication or a re-infection, is treated by the serum, and hence, in the discussion that follows, our efforts are to meet a symptom, or to treat one that by reason of its magnitude has become as serious as the disease itself.

I generally in my consultant work inquire into the method of treatment most familiar with my colleague, and if this method is suitable, I reconcile the future treatment of the case to his methods. Now then, if the doctor favors the use of iron, or of mercury or the like in the treatment of his cases, I do not permit his treatment to be disturbed, but continue the same. My whole endeavor is to treat the new condition of the patient, that the presence of the tube introduces.

This now resolves itself into:

1st.—Getting the patient to accommodate itself to the presence of the tube.

2d.—Getting the patient to take a sufficient amount of necessary food, stimulants, or medicines.

3d.—Preventing any accidents arising from or by the presence of the tube, as (a) clogging of the tube by loosened membranes, or inspissated mucus or other secretions.

(*b*) The expectoration of the tube by coughing or vomiting.

(*c*) Injuries or irritations with inflammation, edema or the like from the presence of the tube.

4th.—The prevention of complications or sequelæ, as

(a) pneumonia; (b) atelectasis; (c) heart failure; (d) the prolonged wearing of the tube; (e) tracheotomy.

To answer the first question I may add that in all my intubations I always remove the silken thread that is attached to the eye of the tube and that is invariably used during the process of intubation, its object being to hold the tube if by any accident or inadvertence it should fail to engage in the larynx, and instead go into the esophagus. It can by means of the thread be quickly withdrawn, and trial made again. So to get the patient accommodated to the presence of the tube, I remove anything that may irritate, hence, this thread. It causes vomiting sometimes, always causes the child's attention being fixed to its presence, the child chews upon it, and then, if it be permitted to remain, there is always the additional danger of the tube being suddenly withdrawn by the patient, or by accidentally pulling upon it. Hence I feel that the additional freedom given the patient by its absence is greater than any security its presence gives to hastily withdraw the tube, or the like. Now then, removing everything that would irritate, I find sometimes there is difficulty in getting the patient reconciled to the tube's presence. When I find that the patient is excitable and that the mere presence of the tube acts as an additional excitant, my endeavor is to quiet the patient, and the more so if the child suffers the additional pain caused by the hypodermic injection of a large quantity of serum, has great difficulty in swallowing, pain in the throat, possibly pain in the ear, and probably, most alarming and grave, a weakened circulation, evinced by an extremely rapid or dicrotic pulse (180 to 200 per minute) rapid respiration (perhaps 60 to 80 per minute) and fever.

For this purpose I have no better drug than opium, in any form. I use the one most familiar to the doctor, and as an example I might say, to a child three years old I have used constantly during a whole course of treatment 15 or 20 drops of camphorated tincture of opium (paregoric) every two, three or four hours as required. And in older children I have used hypodermics of morphine or even opium in suppositories.

This one drug has proven sufficient to meet all indications, and its value is far greater than one could imagine in a condition so grave as frequently presents. This condition is met with at the beginnng of the intubation, and sometimes after extubation, and is similar to heart failure. Experience has proven to me that if I can get a patient to live over the first twenty-four hours with a tube in the larynx I have a fighting chance to get the case through. The greatest danger is the heart. Hence by the use of the opium I place the heart in a splint, or in other words, I so quiet the whole circulation that the most alarming symptoms subside, and assume a more favorable character.

After I have the patient reconciled to the presence of the tube, my next endeavor is to suitably nourish the child.

Where the case be an infant, or below the age of two years, the difficulties are greater. The reason is the liquid character of the food. It is an almost impossible task to get liquids into a child's stomach if a tube be in the larynx, without some little engages in the tube, and brings on a fit of coughing with all the consequences thereof. Hence I try to suit each case, and devise for each its method. If it be a suckling, an infant at the breast, I endeavor to feed it by having its mother lie on a bed or couch with the head and neck lower than the rest of its body. The food will thus pass "over" the tube, by passing over the roof of the mouth. In a "bottle-fed" I also try to elevate the body, and so arrange or lower the head that the child will and can nurse with less difficulty. If the patient be one of older years, and if the child be used to a mixed diet, the difficulty is not so great, for here I can give "semi-liquid" diet, such as pap, crackers and milk, jellies, lady-fingers soaked in milk, oysters, ice cream or the like. And if the case be a child still older, who can take table food, I then give anything and everything the child craves, even if it be a piece of meat or bread, provided it is prepared in a method easily digested. This method has proven to me that the tube simply acts mechanically as an impediment to the entrance of food into the stomach, devise a substance to pass this, and the favorable results are gained. By giving semi-liquids, or such food-stuffs that are porous, such as the lady-fingers, which are made of eggs, flour and sugar, we can soak thereon the necessary amount of stimulants, such as wine, whiskey, or the like, and by this means we can give a very appreciable amount of necessary materials to our patient.

After we have the case in a regular working order, our next effort is to prevent accidents: The first of these is to prevent the tube clogging. Here we must depend upon conditions arising. Should the lumen of the tube become narrowed by reason of the secretions becoming inspissated or dried, we can by use of the atomizer and the peroxide of hydrogen liquefy them and remove them. Should it be impracticable to apply the spray, or should this be impossible, we can use the peroxide diluted as a gargle or even as a drink; the small quantity that engages in the tube is sufficient to act as a cleanser. Should the foreign substance be a piece of loosened membrane the procedure is the same, only our efforts more energetic. Should these methods be unavailing our recourse then is the removal of the tube and, if necessary, the prompt re-intubation.

Another accident, and one that is a natural result of coughing or vomiting or the tube becoming clogged, is the "extubation" by this sudden effort. In such an accident as this, our procedure is suitable to the case. In very many instances, such a removal of the tube is a very favorable sign, and indicates the convalescence of the patient. If we find that the patient can exist without the tube in the larynx, we can then claim the case as "cured" and we need no longer use it. But, if the case be one that the tube was removed by a sudden exertion, and the stenosis still be present, prompt re-intubation is the rule. This accident is more frequent in those cases that have a co-existing bronchitis, or where the tube is somewhat too small for the particular age. If, therefore, we find that the patient keeps on rejecting the tube, almost as promptly as we intubate, our remedy is to pass a larger tube. Sometimes it is necessary to use a tube one or two or even three times larger than the one normally required. It is a very good rule in such cases, where the patient lives quite a distance from the operator, to pass a larger tube at once, and thus prevent any accident from the too long absence of the tube. Whilst the introduction and the extraction of the tube may be made in the most skilful way, and the operation be entirely devoid of any injury, the tube by its presence may exert an evil influence, even like any foreign body, and this sometimes despite every effort to prevent. The cause is the prolonged presence of the tube, that is, the necessity that compels the presence of the tube even after the initial disease has disappeared. The cause belongs to the complications, the results here. If, by the presence of the tube, an irritation of the mucous membrane of the larynx is set up, this may lead to edema, or to an inflammation, which in its way, gives place to ulcerative action, this going so far as to destroy the tissues causing most alarming symptoms of suffocation. The tissues being destroyed, collapse of the cartilage takes place, and it is necessary to continue the tube for an indefinite period and to perform tracheotomy.

These injuries have been fully investigated by Bokai and others, and the result of these observations have been, to always endeavor to prevent. This we do by an early extubation. If the tube can remain away, good. If not, we proceed in the method I will describe further on.

A natural question always asked in intubation is: What are the present dangers to be feared? To this I have always given the same answers. The dangers supposed to exist are pneumonia and atelectasis. That do exist, impending and heart failure. That may result, the prolonged wearing of the tube.

Now regarding "pneumonia" or "schluckpneumonie," as a result or complication of the intubation is to my mind a theoretical danger. I have never seen it. Indeed, I question whether it has ever been seen. I do not deny that pneumonia is present in our cases, and frequently enough to be classed with our prognostic signs. But, I have always found it to be the result of the disease, and not the treatment. I have seen it often enough to know that it exists, but I invariably find it in a certain type, and never in all. For instance, pneumonia may frequently and does often follow after intubation (even 2 or 3 days after the tube is removed and the case, as regards the laryngeal difficulty, pronounced cured) in those cases of laryngeal diphtheria that have come as a complication or sequel to measles. Again it only comes in those cases of measles and diphtheria that have been neglected. In other words, in those cases in which the serum has been used very late, and in which intubation was performed almost as a "last resort." Here again we may find atelectasis, and though the latter disease may be found in the various types of the malady, we always find it in the neglected cases. The cause is not far to find. For, the patient almost suffocating makes its greatest efforts to inspire. The result is a collapse of the lung. Now, in all cases that have died from pneumonia or from atelectasis that I have been fortunate enough to investigate, I have never found any foreign substance in the lungs, or even in the trachea. It is true, that frequently calcareous deposits are seen in and around the tube, but these are more in the nature of what may be expected by placing a metallic substance in a cavity of the body. It is likened to the "tartar" that gathers on a golden crown in the buccal cavity of a normal mouth, and denotes nothing. The treatment of a co-existing pneumonia is really a work of art. We cannot pusue the same methods as in an uncomplicated pneumonia. Indeed every detail is different. For instance, in a pneumonia of the simple kind, we expect the certain limitation of the disease to be a factor, and treat accordingly, with wet packs, sponging, or the like. In pneumonias co-existing with intubation such an expectation is erroneous. The variety and the course of a pneumonia in intubations is vastly different. For instance, a "crisis" I have never met. Hence the treatment of these conditions differs. Our endeavors should always be a supporting treatment. No wet packs. Stimulation, judicious and accurate. As the case is one that may be of long duration, it must not be forgotten, in the choice of our remedial agents. One thing must never be lost sight of and that is the origin. The diphtheria, the measles, and the presence of the tube. Hence in the treatment that must be pursued, our very first endeavor is to treat the diphtheria, and get rid of the tube. This can be accomplished in from five to seven days. After the removal of the tube the pneumonia may still be present, or become better, or be of the catarrhal variety. Whatever it is the treatment of this condition must be slowly persisted in and a satisfactory result may be had. For the treatment of a co-existing pneumonia, or even where bronchitis exists in those suspected cases, as "laryngeal diphtheria following measles," I almost invariably give the treatment from the moment of intubation. This briefly is digitalis, in the form of an infusion or tincture, and carbonate of ammonia, or the aromatic spirits in suitable doses. Strychnine belongs (with me) to the management of every case of diphtheria, and especially those intubated.

For the atelectasis I use counter-irritation, oxygen inhalations, diffusible stimulation and the like. Even after the alarming symptoms have somewhat disappeared, the results must be treated, as an edema of the lung tissue that was the subject of the collapse.

The most frequent danger to intubation is "heart-failure," and this has been seen often enough that it should be dignified with a special name. However, the name means nothing, hence to call it correctly—"paralysis of the heart"—what should be done to prevent this?

No one can cure "heart failure," and I am beginning to believe that no one can cure "beginning (true) heart failure," hence it should always be our endeavor to prevent, even if the pulse rate be good and the physical condition of the patient that of the best, considering, I take it, to be good practice always, to give such medicaments as are always used to strengthen the heart muscles. I would most earnestly emphasize this. It is for the very reason that I have seen sudden heart failures in cases least expected, and in other cases that have been most carefully watched for any "indication," that I have now made it my rule in practice to begin the after treatment of every case of intubation with a hypodermic injection of a suitable dose of strychnine. The strychnine I continue and use it as religiously as I would the nourishment or the stimulant. As an example of my method, were I to intubate a case of diphtheria of the larynx of any type, I would make this plea as earnestly as I would for the serum. If I were to intubate a case of the type coming as a sequel to measles, and that had been neglected, or the intubation postponed, I should begin my treatment with a hypodermic injection of strychnine, even before the intubation, and most certainly before the serum. So much good have I seen result from the correct application of the strychnia, that almost hopeless cases have been cured and the use of the tube and serum made possible by the prior use of the strychnia; for these reasons, and my examples are many, and the instances not a few, I always direct, no matter what may be the treatment, that as long as my tube is in the larynx or so long as the patient requires medical attention, so long should strychnine be the sheet anchor of the treatment.

To ask me, therefore, in the briefest terms, what may be my treatment of the intubation in laryngeal diphtheria, I would as briefly reply:

The introduction of a suitable tube, not in ratio to the age, but in ratio to the size and the condition of the child.

Second, food, liquid if possible, semi-liquid if necessary, and always. And solid if necessary.

Third, strychnine, in proportionately large and decided, perhaps in increasing doses.

The most serious question now is, *the removal of the tube.*

This requires considerable thought. Since the introduction of the serum treatment, experiences thus gained have been of much assistance in deciding. It has been proven by clinical manifestations that it takes from 72 hours to 120 hours for the membranes to disappear from the throat of those so afflicted. This is a general rule, and is seen most frequently. Of course there are exceptions. However, being guided by this, I never make my first attempt at a removal until 120 hours have elapsed; if my case be a normal one, the serum acting correctly, my case may then be cured. If, however, the case cannot exist without the presence of the tube, I immediately re-intubate. I then permit the tube to remain undisturbed for 4 days more, and then attempt removal. Should there be the slightest symptom of suffocation, my tube remains until no longer required, be the time a day, week or month. If the tube remains longer than the second extubation, I dignify it with the title, "a prolonged intubation." Here then, begins a change in my treatment. I begin to intubate and extubate with progressively smaller tubes until the case no longer requires them. Meanwhile I never forsake the strychnine, and continue its use in progressively larger doses until I have obtained a satisfactory result—the cure of my patient.

SOCIETY PROCEEDINGS

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN

An Ordinary Meeting of this Society was held on Friday, March 20, 1903, at 11 Chandos Street, London, W.

Dr. Henry Ashley in the Chair.

Excessive Dimpling of Skin.—Mr. Henry J. Curtis showed on behalf of Mr. Stansfield Collier, a male infant, aged eight months, born prematurely at eight months, the membranes having ruptured a fortnight previously. There was extreme dimpling of the skin over the olecranon processes and over both sides of the knees. Both upper and lower limbs, particularly the legs and thighs, showed very marked lateral compression, also seen in the skull, the forehead being in addition flattened from before back and the tip of the nose depressed as is frequently observed after the cure of hare lip in a severe form.

A vertical grove existed over the middle of the body of the right inferior maxilla, as also of the postero-internal aspect of the right leg in its lower third. This groove in the leg, taken with a slight one surrounding the remarkable and pendulous buttocks, it was suggested, might be accounted for as the result of the funis constricting the buttocks and then passing down along the back of the leg.

Both feet were clubbed.

A slight degree of skin dimpling is not uncommon. It is probably the result of amniotic adhesions occurring when there is deficient liquor ammii. In the present instance, the extreme degree and universality of the compression effects would imply very considerable deficiency in the amniotic fluid, long anterior to the rupture of the membranes. A further point of interest was the evidently stunted condition of the bones of the limbs, especially the arms and forearms, and to a less extent, of the legs, when contrasted with the body length.

Infantilism.—Dr. G. A. Sutherland showed a case of infantilism. The patient was a boy, eleven years old, who weighed twenty-eight pounds, and was thirty-nine inches in height. At the age of three years he weighed nine pounds. The body and limbs were well formed, and the only local indication of disease was a clubbing and blueness of the fingers. The expression of the face was infantile and the mental condition was backward. Dr. Shuttleworth suggested thyroid treatment, although he admitted that the child showed no marked signs of cretinism. Dr. A. E. Sansom said the absence of marked signs of heart disease did not exclude that condition.

MANIA IN CHILD.—Dr. Robert Hutchison showed (*a*) a girl of five and one-half years of age, who exhibited great excitability, incoherence and restlessness, with a tendency to destructiveness and to repetition mimicry. The mother alleged that the child had been perfectly well until two years previously, when another baby was born, and from that time onwards she had been in her present condition. Dr. Hutchison was inclined to regard the case as one of chronic mania as the child appeared to have been quite normal mentally for three years after birth. There was no history of any illness or injury to account for the condition. (*b*) A baby, aged five weeks, suffering from enlargement of the left side of the tongue. The left arm and leg were also distinctly thicker than the corresponding limbs, on the opposite side, but there was no want of symmetry in the face, or, so far as one could see, in the trunk. The family history and general health were good. The case was apparently one of hemi-hypertrophy.

The cases were discussed by the Chairman, Dr. Shuttleworth, Dr. Sutherland and Mr. H. J. Curtis, and Dr. Hutchison replied.

CONGENITAL SARCOMA.—Mr. H. J. Curtis read a paper upon a case of congenital periosteal sarcoma, arising in connection with the acromion process of the left scapula, removed from a boy aged five and three-quarters months, the patient being also exhibited to the Society. At birth the tumor was as large as a small hen's egg. At the date of the operation it formed a swelling as large as a good-sized orange, with several smaller nodules. It extended from the point of the shoulder to the lobe of the ear, and could not be moved independently of the scapula. It was eleven inches in horizontal circumference. On removal it was found to be slightly connected with the acromion process, close to the acromio-clavicular articulation; it was therefore a periosteal growth, the rarer variety of peripheral (as distinguished from endosteal) sarcomata, its tendency being only secondarily to invade the bone. Microscopically it proved to be a mixed spindle and round-celled sarcoma. Attention was also drawn to a type of tumor having a somewhat similar appearance microscopically, sometimes seen in young children, which though they recur, do so very slowly, and grow very slowly. The extremely low malignancy sometimes observed in such fibro-cellular tumors, as Mr. Stassfield Collier prefers to consider them (having such a case still alive four and one-half years after the first operation), is a point to be remembered in attempting to make a prognosis.

AMAUROSIS.—Dr. Henry Ashby and Mr. Sydney Stephenson read a paper upon "Acute Amaurosis following Infantile Convulsions." They described a series of cases of amaurosis, which they believed to be directly due to severe convulsions. Thus, the infants develop a series of convulsions with coma (resembling the status epilepticus of adults) and upon recovery, are found to be blind and sometimes to be hemiplegic or aphasic. There was no evidence of meningitis. Ophthalmoscopic examination yielded negative results. The authors distinguish this form of blindness from the amaurosis, also without ophthalmoscopic signs, which may accompany or follow posterior basal meningitis in infants. They concluded (1) that there is a form of post-eclampsic amaurosis due to anesthesia of the visual centers, occurring in infants; (2) that the convulsions, which may be due to various causes, are apt to be severe and accompanied by coma; (3) that the amaurosis may be associated with aphasia of hemiplegic distribution; and (4) that the amaurosis is for the most part transient. Dr. A. E. Sansom suggested as cause for the blindness either a poisoning or a vasomotor ischemia of the nervous mechanism involved. Dr. R. Hutchison alluded to amaurosis following superficial meningitis. Dr. George Carpenter mentioned a case of a somewhat analogous nature. Dr. Ashby replied to the discussion.

Pneumococcic Arthritis.—Mr. Alfred H. Tubby read a paper on a case of pneumococcic arthritis, affecting a male infant of fourteen weeks of age. The child was admitted with pain and swelling of the right knee, and a temperature of 102°. Ten days previously the child, who had hitherto been healthy, became fretful and cried, especially when the right leg was touched, and the mother said he was treated for rheumatism. The right leg became red and swollen. There was no history of an accident or injury. On admission, the child was evidently very ill, and the right knee was bulbous, fluctuating, very red and tender. Two lateral incisions were at once made and much pus was evacuated. A drainage-tube was passed through the joint. For ten days the patient lay in a perilous condition, but the temperature gradually fell to normal and the discharge diminished. Careful and repeated examinations of the chest were made, but no signs of pneumonia could be discovered. The pus from the joint on examination showed diplococci and cultivations gave the appearance of *micrococcus pneumoniae,* and Dr. Lazarus Barlow was of opinion that pus contained this organism in pure culture.

Mr. Tubby then referred to the literature of the subject, and alluded to two other cases which had been under his care at the Evelisa Hospital. In one pneumoniæ pulmonis preceded a pneumococcic coxitis, and in the other case pneumococcic arthritis occurred in the knee without the development of pulmonary symptoms. He also said that these cases threw light on the pathology of "acute infective arthritis of infants."

PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, Tuesday Evening, April 14, 1903.

President D. J. Milton Miller in the Chair.

Congenital Luxation of the Hip.—Dr. Gwilym G. Davis read a paper on the results of the bloodless reposition of congenital luxation of the hip, with a report of cases. The first patient was a boy nearly six years of age. Two years and five months ago, after eight weeks' extension in bed with four pounds, reposition was effected by flexion, abduction, and outward rotation, as advised by Paci, with tenotomy of the adductor longus. Repeated reluxations occurred, and the ultimate result was an anterior transposition, with a shortening of two cm., disappearance of the lordosis, and an excellent functional result.

The second patient was over six years of age, and had a double luxation. Replacement was carried out by the Paci method, as in the first case. One hip remained in place, and—two years and five months after the operation—is apparently normal in every way. The other hip is transposed anteriorly and upward. The lordosis is nearly or quite gone; and the functional result is excellent, except for a slight limp.

The third patient was a child of three years, with a double luxation, both having been replaced by the same manipulations as in the preceding two cases. One hip remained in place. The other repeatedly came out of place, so an apparatus was applied. The condition of the one hip was perfect, six months after the operation. The patient was then lost sight of.

The fourth patient was a child eight years of age. One hip was replaced five years ago by the Paci method. This has remained in position ever since, and appears absolutely normal. The other was operated upon and fixed in an anterior transposition.

The results of many observers show that absolutely perfect results are rare. According to Kirmisson, Hoffa, Köllicker, Schede, Codivilla, and others, the result is perfect in about five per cent of cases. Nearly perfect results occur in about fifty per cent; and most of the remainder are transpositions with good functional use of the limb.

The method of reduction used in these cases was that of Paci, supplemented by tenotomy of the adductor longus tendon. The dangers of following Lorenz's violent method of procedure were shown by quotations from Lorenz himself, Hoffa and others.

Dr. De Forrest Willard also discussed congenital dislocation of the hip and presented a patient, one of a number awaiting admission to the University Hospital for reduction of congenital dislocation. As the defect was unilateral, the girl did not present the marked lordosis seen in double dislocation. She had, however, great shortening of the limb; the head and and neck lay far up upon the dorsum of the ilium; and the skiagraph showed the usual distortion and deformity of the femoral head and neck, as well as the deficiency in the lip of the acetabulum.

Dr. Willard said that, so far, his efforts, both before and since Lorenz's visit to this country, have uniformly resulted in the successful reposition of the head of the bone into the site of the acetabulum; but that his previous efforts had usually been followed only by the re-establishment of the deformity within from one to twelve months after the child had commenced to walk. Whether the cases now under treatment will result similarly, Dr. Willard considers still an open question. Since observing the amount of force applied by Dr. Lorenz, he has used greater power than previously, as he thought that his failures during past years might be due to insufficient disabling of the muscles. He is not, however, convinced that extensive tearing of the muscular fibers adds to the firm retention of the head of the bone in its proper position. In his judgment, permanent retention depends rather upon the original condition of the acetabulum, the head, and the neck. Moreover, he does not believe that it is so wise to tear the adductor muscle from its attachment as it is to divide it with a clean tenotome. The term "bloodless," he thinks to be a misnomer, as a torn muscle bleeds more than a cut tendon. The hemorrhage is merely concealed from sight.

Dr. Willard also is not convinced that the transposition of a posterior luxation into an anterior and upper one is an advantage to the child, especially when the limb has been used for eight or ten years, and the muscles and the skeleton have become accustomed to the position; for the torn muscles will not act so freely as the original ones. In cases, also, that have come here after operation in Europe, said the speaker, locomotion has been restricted and has become painful; and the slight change in maintaining the equilibrium has not been sufficient to compensate for the discomfort and injury. Many of the patients that have reached manhood with the femoral heads upon the dorsum, are not only strong, but are even athletic.

Dr. Willard said that one of the best evidences of the tactile and mechanical skill of Lorenz is the enormous amount of force that he exerts without producing fracture of the limb; in the hands of an inexperienced man, this amount of force would often be injurious. Lorenz has met with a number of serious accidents, and careless surgeons will undoubtedly have many catastrophes. Another thing against which a note of warning ought to be sounded, said the speaker, is a fact that is already being evidenced and will probably lead to many dire results; this is that efforts at reduction, under mistaken diagnosis, often stir up tuberculous processes in cases of hip disease that have been partially cured. He has seen a number of these cases, and fears that owing to the present mania many quiescent hips may be roused to suppuration and increased caries.

In old and difficult cases of congenital dislocation, Dr. Willard still believes that preliminary extension is advantageous. In spite, however, of the facts that nearly every case has not only a malformed acetabulum, but also a deformed head and neck of the femur, the condition is such a permanent one and our results in the past have been so unsatisfactory that it seems justifiable to use powerful efforts to secure the best possible relation of the femur to its socket. A combined procedure, consisting in forcible stretching, section of the adductors, and, in irreducible cases, the laying open of the capsule, will probably be the American outcome of the present operation, in Dr. Willard's opinion.

The speaker also mentioned thirteen hips now under treatment and in plaster casts, as follows:

DOUBLE

1. Girl, 3½ years, both femurs reduced without cutting.
2. Girl, 9 years, reduced easily; tenotomies of adductors.
3. Boy, 4 years, reduced.

SINGLE

1. Girl, 7 years, reduced, tenotomy of adductors, right.
2. Boy, 2 years, easily reduced, left.
3. Girl, 2 years, easily reduced, left.
4. Girl, 6½ years, reduced, right.
5. Boy, 3½ years, reduced, left, tenotomy of adductors.
6. Boy, 10½ years, reduced, left.
7. Girl, 9 years, reduced, left (colored).

Dr. James K. Young exhibited a patient to illustrate the results of operation for congenital dislocation of the hips when the patient is too old to have the forcible reduction operation performed.

The child was a girl, fourteen years of age, with congenital dislocation of both hips, who had consulted Dr. Young at the Polyclinic Hospital in October, 1902. The spine was greatly lordosed in the lumbar region, the trochanters were shortened 2½ inches above Nelaton's line, and the head of the femur on each side was dislocated upward and backward on the dorsum of the ileum.

Professor Lorenz, during his visit to this country, examined this girl. On account of her age he advised a subcutaneous division of the adductor muscles, with manipulation of the hips, fixation in plaster for two weeks, and the subsequent use of a spine brace. The operation was performed at the Polyclinic Hospital on January 12, 1903, and consisted in a complete subcutaneous division of the adductor muscles, close to the pubes. The limbs were abducted, flexed, and extended; traction was applied; and an attempt was made to place the head of the bone in an anterior position. Three weeks after the operation a spine brace was applied; it extended well down over the hips.

As the result of the operation, the trochanters have descended three-quarters of an inch, and are placed further forward; the lordosis has been greatly diminished; and the height of the patient has been increased about two and one-half inches. The awkward, sideways, waddling gait that she exhibited before the operation has been greatly modified, and the pain from which she suffered has been entirely relieved.

Diagnostic Difficulties.—Dr. H. Augustine Wilson, by invitation, opened the discussion. He thinks it is a pity that something cannot be done to carry into other fields the phenomenal results in diagnosis that the recent visit of Dr. Adolf Lorenz to this country has produced in that of deformities of the hip. Cases that had been considered almost every other condition were brought to light as congenital dislocations. Nearly all had, at some time in their progress, been treated for rheumatism. Of the several hundred patients with hip deformity seen by Dr. Wilson in connection with the Lorenz Clinic at Jefferson College Hospital in December last, the vast majority were other than congenital dislocations. The worst cases were those that had been pronounced cured by osteopathy. Quite a large number had been correctly diagnosticated by the parents of the patients, after reading newspaper descriptions.

Dr. Wilson thinks that a very grave responsibility rests upon the general practitioner, in correctly diagnosticating congenital dislocation very clearly, before secondary changes have occurred in the bones that form the joint; so that reduction may be accomplished with ease, and permanent function secured. The difficulty in securing reduction is in direct proportion to the age of the child; the results, of course, are in the same ratio. The longer the child walks upon a dislocated hip, the greater the difficulty becomes; because the parts adjust themselves to the abnormal conditions, alterations occur in adaptation, and the disused acetabulum becomes filled with fibrocartilage.

To say that all cases become horribly deformed and that the patients suffer severe pain and become incapacitated, because a small proportion are so affected, is, Dr. Wilson thinks, an exaggeration. He has seen a large number of adult patients in whom adaptation has been so well accomplished that the shortening is the only apparent disability, and this disability has been overcome by wearing a high-soled shoe. He had just seen at the Jefferson Hospital a woman of twenty-five, the mother of several children. The patient had learned for the first time that her hip was dislocated. Upon careful inquiry, it was learned that one leg had always been short; but the woman had thought that, to a greater or less extent, this was the case with everyone. Dr. Wilson also mentioned the cases of two youths, fifteen and seventeen years of age, respectively. They were athletes, one playing foot-ball, and the other being a long-distance bicycle-rider.

Some cases are more seriously affected by a mild disability than are others; therefore it is the duty of the surgeon to fully restore the function in early life, before the hip has been used in walking, if possible. Dr. Wilson believes that there is more than ample evidence in radiography, in the records of operations, and in postmortems, to prove conclusively that before the end of the second year the parts are normally constructed in most cases, and that the dislocation is then of a mild type. Sometimes there is merely a relaxed joint. All this, as Dr. Lorenz has definitely proved, indicates the period at which the correction should be undertaken.

Dr. Wilson thought that Dr. Davis was to be congratulated upon the most excellent results obtained by him in the hips that he reduced bloodlessly; but Dr. Wilson could not agree with Dr. Davis that anterior transposition is an improvement upon the former posterior position, and thought Dr. Davis in error in viewing such results as satisfactory. Dr. Wilson also thought it an error to think that the Lorenz bloodless method requires great force, simply because Lorenz skilfully applies such force in severe cases that have been allowed to walk. That this great force can be applied so skilfully by Lorenz, without mortality, often without shock, and without positive injury, as the result of his vast experience, shows his knowledge and dexterity. At the same time Lorenz has practically demonstrated that no great force is required in his reposition of congenital dislocations, when this is done during the first year of the child's life; and he does not himself consider his bloodless method suitable in a child that has been allowed to walk until he is six or seven years of age. Dr. Wilson thinks that in such cases the so-called intermediary operation (cutting) will afford the best results, without the mortality or the disagreeable features of Hoffa's operation. He urged that confusion be avoided in referring to the Lorenz bloodless, weight-bearing method, in which there is no preliminary application of extension in bed. The method depends upon the complete reposition and fixation in a position of hyperabduction and flexion, with external rotation. This position is maintained for six months in plaster of Paris. Dr. Wilson thinks it should be recognized that a man that has performed two or three hundred cutting operations and fifteen hundred bloodless repositions, and has originated and formulated definite procedures, is better able to determine the technic than is any other person. Rational changes in technic, in order to meet the individual conditions of patients, will, of course, be necessary.

Dr. James K. Young said that Dr. Davis, in his paper, had covered the subject so thoroughly that there was very little left to be said in discussion. He thought that the battle that has for several years raged between Kirmisson and Lorenz would still continue.

Dr. Young thinks that the operation as performed by Lorenz requires great skill, in addition to great force; and believes that if proper care be taken in performing this operation, the number of accidents will be greatly diminished. The list of accidents given in reports will probably deter many from attempting this operation. Up to the present time, Dr. Young has himself performed seven of these operations, and has seen as many more performed. In none of these has there been any difficulty, except in one instance, in which there was a slight interference with the venous circulation, lasting half an hour.

Dr. Davis had said that one cannot tell the position of the head of the femur until the cast has been removed; but Dr. Young thought the test given by Lorenz to prove that the head of the femur is in the proper position to be a good one, and one that may be considered reliable until disproved.

Dr. Young considers age a very important factor, and thinks that attempts to reduce congenital dislocations should not be made after the time-limit given by the originator of the improved operation has expired.

It occurred to Dr. Young some time ago that some cases of congenital dislocation might be due to birth-injury; this would account for the difference in the reduction and cure of the two groups of cases. He consulted Dr. Barton Cooke Hirst upon the subject, and the latter assured him that it is a very rare accident to have a dislocation of the hip occur at birth. That these accidents are possible, however, is proved by the fact that one occurred to Dr. Phelps in his earlier experience. After the reduction of the dislocation in this instance, the hip remained in its proper position. The possibility of such an occurrence in difficult births has been recognized since the time of Hippocrates, who referred to this subject in his work on articulations.

In concluding the discussion, Dr. Davis expressed surprise at the somewhat pessimistic attitude of Drs. Willard and Wilson.

Dr. Davis thinks that very much is gained by treatment. The disability is often marked, and tends to increase as the patient grows older. The lordosis increases; the buttocks project in an unsightly manner; the gait is waddling; and long-continued walking or standing, or ascending stairs, is accompanied with discomfort and often with positive disabling pain. Dr. Davis considers it a serious condition.

He thinks that under treatment at least half the cases can be practically cured; and that in nearly all the remainder, the head can be fixed in anterior transposition. This is a distinct gain, for it prevents the head of the bone from sliding up or down while the patient is walking; it removes the lordosis; it prevents any increase in the deformity or disability; and it enables the patient to walk with comfort, even if there is slight limping and some shortening. Dr. Davis does not agree with Dr. Willard that transposition is no gain.

Dr. Davis' cases were treated by previous extension and the manipulations of Paci, in order to avoid the liability to the injuries so often accompanying the violent procedures of Lorenz. The speaker said that he is familiar with Lorenz's statement that inability to extend the leg is an indication of reposition, but he does not accept this statement. He prefers to remove the cast in order that he may see that the head has remained in its proper place.

Spastic Paralysis.—Dr. William G. Spiller, by invitation, exhibited two cases of spastic paralysis of the lower limbs in which the correction of the talipes equino varus had been of much benefit to the patients. In each case the spastic paralysis was the result of imperfection in the pyramidal tracts; in one case, of imperfect development; and in the other, of early primary degeneration.

The first case was one of premature birth, and was a typical example of what some of the French writers understand by the term Little's disease. The child was born in the seventh month of intra-uterine life, and her lower limbs were very spastic. She had never been able to walk without crutches before the operation, and even then she had walked on her toes. She was intelligent, had never had convulsions, and had perfect use of her upper limbs. The deformity of the feet was corrected about a year ago; and the child is now able to walk very slowly without crutches or assistance, and to put the feet firmly on the ground. Dr. Spiller spoke of the importance of making a distinction between a case of this kind, and one of spastic paralysis resulting from an injury of the brain; and as in the former, mentality may be unaffected, epilepsy may be absent, the upper limbs may be normal, and the spasticity may be diminished even late in life.

The second case was an example of the family form of spastic spinal paralysis, resulting from early degeneration of the pyramidal tracts. The case had been previously reported, but was exhibited in order to show the improvement in the gait obtained by the correction of the talipes equinovarus.

The operation in one case was done by Dr. J. William White, and in the other by Dr. De Forrest Willard.

SPASTIC PARAPLEGIA AND OPERATION.—Dr. James K. Young exhibited a patient in whom spastic paraplegia had been improved by operation. He said that this case shows the beneficial results obtained by operation when spastic paraplegia is due to cerebral palsy. The patient was four years old when he was brought to the University Hospital for treatment on June 7, 1897. He was suffering with spastic diplegia. He had had chicken-pox, but none of the other eruptive diseases of childhood. He had not been delivered with instruments, but had been artificially fed. There had been no deformities in any of his ancestors, nor was there tuberculosis in any member of his family. His own general health was fair.

The cause of the attack of spastic diplegia could not be accurately determined, but it was probably congenital. Both hips were held at a right angle, and strongly abducted by the contraction of the flexors. Subcutaneous division of all the contracted tendons was performed; the adductors, rectus, sartorius, all the hamstrings, and the tendon of Achilles, were thoroughly divided under anesthesia. The limbs were forcibly flexed, and retained in plaster-of-Paris dressings for three weeks. Massage was given for some months, and a double paralysis-brace was applied. The result is the complete reduction of one limb, with a slight contraction of the tendon of Achilles in the other. The arms have completely recovered. The mental condition is apparently perfect, and the child is active and in excellent health.

MEASLES IN NEW-BORN.—Dr. Edwin E. Graham reported a case illustrating the non-susceptibility of the new-born to measles. Mrs. S., aged twenty-four, was seen on the morning of February 28, with coryza, a cough, a temperature of 102 2-5° F., and the rash of measles covering her face and upper neck. There were also a few isolated spots on her body. The following morning, after a normal labor at the end of the full period of uterogestation, a male infant, presenting absolutely nothing abnormal, was born. At this time, the rash had spread over the entire body of the mother. The baby was free from rash, had a normal temperature, and presented no unusual symptoms. It was at no time isolated from its mother. It was nursed regularly every two hours, and was treated exactly as if it were not exposed to the contagion of measles. With the exception of a severe laryngitis, the mother made an uninterrupted recovery. When the infant was nine days old the other child of the family, a boy of eighteen months, developed a typical attack of measles. At the age of six weeks, the infant had shown no symptoms of the disease.

From the reports of Mayr and Boutillier and of others, it appears that the susceptibility to the disease is certainly very marked after the age of one year. Thomas reports six instances in which the rash was present at birth; and von Jurgenson reports cases in which, the mothers having contracted the disease just before delivery, the rash appeared on the children a few days after birth. The report of an epidemic by Carr tends to show that six months is the age at which distinct susceptibility to the disease begins, and that after the age of one year the liability to contract the disease is very marked.

PERTUSSIS AND TUBERCULOUS MENINGITIS.—Dr. Edwin E. Graham also reported a case of pertussis complicated by tuberculous meningitis. The child, aged nineteen months, was first seen in consultation with Dr. Gordon, on March 19. The family tendency to tuberculosis was not marked. The patient had always been healthy until the development of pertussis, two months previously. It had had one convulsion when eight days old, probably from improper feeding. The little girl had walked at fifteen months; and before the attack of pertussis, she could speak a few words and understand language perfectly.

Three weeks before being seen she had become dull, heavy and apathetic; but she took nourishment well and did not cry. The stupor gradually increased. At this time the pulse averaged 65 to 75, and the temperature was usually normal or subnormal. There was occasional vomiting, and nourishment was taken fairly well from a spoon. During the five days preceding Dr. Graham's visit, the stupor gradually became more marked. The arms and legs were moved slightly. Cheyne-Stokes respiration had been present since the increase in the stupor. The temperature was 101.6° F.; respiration, 28; pulse, 150. Sensation was evidently better preserved on the left than on the right side. Sensation to heat and cold was well preserved. The attacks of coughing were now rare and very light. The pupils were dilated and responded sluggishly to light; both eyes were occasionally sluggishly opened. There was no facial palsy and no spastic condition.

During the five days following, until her death, on March 25, the temperature ranged from normal to 105.8° F. Respiration continued of Cheyne-Stokes type, varying from 30 to 80. The pulse ranged from 130 to 180. The child was fed every four hours, by means of a tube, with four ounces of peptonized milk. The stupor gradually became more marked; and a progressively increasing spastic condition appeared, involving both arms and legs. The eye-examination showed the media to be clear. The optic discs were clearly outlined, and there was no evidence of pressure. The urine was normal. Lumbar puncture showed the fluid to be highly albuminous. After centrifugation, the sediment consisted of erythrocytes and leucocytes. The differential count showed: Lymphocytes, 91 per cent; and polymorphonuclear leucocytes, 9 per cent. Spreads stained for bacteria showed negative results. Cultures remained sterile. The autopsy showed tubercular meningitis at the base of the brain.

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN

A Meeting of The Children's Society was held at No. 11 Chandos Street, on Friday, April 17, at 5.30 p.m.

Dr. Lewis Marshall (Nottingham) in the Chair

Ichthyosis Hystrix.—Dr. David Walsh showed this case in a female six and one-half years of age. The condition was noticed shortly after birth and occurred on the neck and face. The part on the side of the neck was verrucose and deeply pigmented, that on the face was in a hypertrophied condition somewhat like cheloid but without warts or pigmentation and terminated at the middle line.

Mr. George Pernet said he did not agree with Dr. Walsh's views, the greater part of the growth was of the nature of a white mole: it was certainly developmental and that was as far as he would admit. He said it did not suggest to him cheloid and it did not come within the category of warty streaks.

Dextrocardia.—Dr. Porter Parkinson showed a case of this affection in a child of six years. It was admitted into the hospital with rheumatic fever and the condition of the heart was discovered in the course of a physical examination. The heart sounds were natural and there was no displacement of viscera.

Scurvy.—Dr. George Carpenter showed a female infant of nine months, the prominent symptom of which was hematuria. The child's gums were spongy, there was no sub-periosteal hemorrhages, it was also rickety. He drew attention to two features in the case, namely, well-marked "snuffles," and extensive craniotabes over the parietal bones. He had frequently called attention to this situation in the skull as being the usual site and not the occipital bone as was taught. He said that craniotabes was most common during the second, third and fourth months of life and that by the ninth month it was infrequently met with, that during the pre-rickety period of life craniotabes was a marked feature and when rickets was present craniotabes was found infrequently. He thought there was a difficulty also in giving a true value to chronic "snuffles." In some, congenital adenoids were present, in others they were not, and again in others the posterior nares could not be digitally examined. Some were certainly syphilitic manifestations but about others there was some doubt. This patient had congenital adenoids. When he found craniotabes in a patient he suspected syphilis and it prompted him to make an exhaustive inquiry.

Dr. Edmund Cautley thought that too much stress could not be laid upon "snuffles" in hospital practice, but in private practice he would look upon it with suspicion. He could not agree with Dr. Carpenter that craniotabes was very frequently associated with syphilis. He looked upon craniotabes in many instances as due to errors in diet which later on might lead to rickets or other disorders of nutrition. He thought syphilis might predispose to it inasmuch as it debilitated the child and impaired its nutrition. He called attention to venous dilatation on the scalp which a French author sought to connect with syphilis, but which he regarded as due to malnutrition and thinning of the skin of the scalp.

Mr. Sydney Stephenson asked whether the condition of spongy gums was invariably limited to the site of erupted teeth.

Dr. G. A. Sutherland thought the condition of craniotabes was not nearly so common as had been taught; he was inclined to believe it was syphilitic in origin. In his experience also the parietal bone was the most frequently affected, but in some cases it was singular how generalized the condition was in the skull bones. "Snuffles" was another difficult problem. "Snuffles" was not to be regarded as diagnostic of syphilis: if there was any doubt during the first two or three months of life as to whether a case was "adenoids" or syphilis, he would say syphilis was very much more likely than adenoids. It was surprising how many children were brought for advice because of hematuria, especially under the age of twelve months. At an autopsy in one case the pathologist found an extravasation of blood under the mucous membrane of the bladder.

Mr. J. S. Macintosh had seen many young babies with congenital adenoids and thought that some cases of catarrh of nose were gonorrheal in origin.

Mr. Henry Skelding (Bedford) asked whether the child had been taking mercury before coming to the hospital. He had seen a similar condition produced by that drug.

Dr. Lewis Marshall (Nottingham) said that children suffered from "snuffles" from causes which were unimportant. It would be very rash to arrive hastily at the conclusion that children who suffered from "snuffles" were syphilitic necessarily. He thought that craniotabes was not as common as was supposed, and when it existed he did not attribute it to syphilis: malnutrition might induce such a condition. He did not think Dr. Carpenter had very clearly made out that his case was one of scurvy rickets. He did not notice the mention of sub-periosteal hemorrhages or a purpuric eruption. Hematuria was very common in children, and the causes were often quite unimportant, one of the commonest was lithiasis. He had recently seen in the Midland counties three or four cases of scurvy rickets which were the direct products of Mellins' Food.

Mr. George Pernet considered craniotabes suggestive of syphilis, and with regard to "snuffles" he would not diagnose congenital syphilis on that condition alone. He had noticed how pale the infant was owing to improper feeding with food deficient in iron. He would advise the daily use of thoroughly cooked green vegetables to remedy that deficiency.

Dr. George Carpenter in reply said that his experience of craniotabes had been drawn from the observation of 238 typical cases of that state, and he did not think the condition an uncommon one. He did not consider sub-periostal hemorrhages and purpura essential to the diagnosis of scurvy: the case he had shown was, in his opinion, typical of that condition, although it lacked these manifestations on which Dr. Marshall had laid stress. Spongy gums did occasionally rise in edentulous infants, but it was unusual. In his experience, infants taking mercury did not develop spongy gums and hematuria, and his case had not taken that drug.

Congenital Deformities.—Dr. Lewis Marshall (Nottingham) read a paper on cases of deformity of the hands and feet reproduced with singular faithfulness in five succeeding generations. Each hand and foot lacked the distal and middle phalanges and the little and the ring toes were ill-developed.

EDITORIAL

THE DIPHTHERIA BACILLUS AND THE BACILLUS OF HOFMANN

In various towns, schools and institutions attempts have been made to stamp out epidemics of diphtheria by isolating the sick, until by bacteriological examination their throats had been proved to be free from the diphtheria bacilli. In several of these cases acting on the well-known fact that the persons who have come in contact with the disease may acquire and carry in their throats and noses virulent diphtheria bacilli without themselves being ill, "contacts" have been examined and those found to be harboring diphtheria bacilli isolated in the same manner as the convalescents.

Such a procedure has its most hearty advocates, but at the same time there are those who believe that the bacillus of diphtheria may occur in the throats of healthy persons who have not been in contact with the disease and that, therefore, such attempts to suppress epidemics by the isolation of healthy persons not only prove useless, but entail great privation on the isolated persons.

Dr. S. Graham Smith, of Cambridge (*Journal of Hygiene,* April, 1903), has contributed an able paper on the distribution of the diphtheria bacillus and the bacillus of Hofmann in the throats of contacts and normal persons, with the purpose of showing that the virulent diphtheria bacilli rarely exist in the noses and throats of healthy persons who have had no opportunity of acquiring them by contact, but that the method of isolating *convalescents* and *healthy persons harboring* the bacillus is unquestionably of great benefit in suppressing epidemics of the disease.

He first analyzes the views of the different authors and the statistics on which they are based, discussing the occurrence of diphtheria bacilli in notified cases, the occurrence of diphtheria bacilli in persons who have been in contact with cases of the disease, or with others who acquired the bacillus in this way; contacts with sore throats, and the results of the examination of healthy persons who have not recently been in contact with the disease.

An interesting portion of his paper is devoted to the study of the various types of bacilli which closely resemble the bacillus of diphtheria, the bacillus of Hofmann receiving particular attention, under which heading he shows that, whereas the bacillus of Hofman has a very wide distribution, and its resemblances are so close to the diphtheria bacillus, it is unwise to assert that the causal agent of diphtheria is widespread, because it is by no means proven that Richmond and Salter's conclusions that Hofmann's pseudo diphtheria bacillus is an attenuated variety of the true diphtheria bacillus are correct.

The author's summary is striking and we here reproduce it in full.

1. Diphtheria bacilli have been found in a considerable proportion of persons who have come into contact with cases of diphtheria or with other infected persons.

2. Such persons have been shown to be a grave danger to public health, especially when frequenting schools or institutions, and to constitute the usual channel by which the disease is spread.

3. Very satisfactory results have followed on the isolation of convalescents from the disease and of infected "contacts," where two or more consecutive negative examinations have been required before release.

4. Carefully conducted investigations amongst healthy persons, who have not at a recent date been in contact with diphtheria cases or infected "contacts," have shown that virulent diphtheria bacilli are very seldom (three examples amongst 1,511 persons) present in the mouths of the normal population. This fact renders the discovery and isolation of infected persons a practicable possibility and offers a fair prospect of discovering and isolating the majority of them in any outbreak.

5. Diphtheria bacilli are usually distinguishable on morphological and cultural grounds, but whenever possible it is desirable that their virulence should be tested.

6. The bacillus of Hofmann is innocuous to man, and is a very common organism in the mouths of the poorer classes. The distribution of this bacillus points to the conclusion that it is carried from mouth to mouth in the same way as the diphtheria

bacillus, and therefore its wide prevalence in schools attended by poorer children is significant, as showing how widely spread and uncontrollable an outbreak of diphtheria may become unless measures are early taken to deal with infected contacts.

Such a piece of work as this is certainly commendatory as it sheds much needed light on the etiological factors of this dread disease. With a few more studies of this kind it seems not impossible that we may look forward to the time when, with enlightened views on the etiology and perfected methods of treatment, diphtheria will become a negligible quantity in the mortality of the future.

THE CAUSE OF SMALL-POX

It is a matter of sincere congratulation that one by one the diseases of hidden origin are yielding up the secrets of their causation, and especially congratulatory is it that American research has once more added to its laurels in the matter of smallpox.

There seems to be every reason now to suppose that the germ of small-pox has been discovered, and that Drs. Councilman, McGrath and Brinckerhoff have definitely demonstrated the etiological factor of this exanthem.

For a number of years these gentlemen have been working on the disease and with the liberal and enlightened co-operation of the Health Department of the City of Boston they are enabled to present, in the May number of the *Journal of Medical Research,* a preliminary communication on the etiology of variola.

They say that in the lower levels of the epithelium of the skin, before there is any evidence of vesicle formation, there are often small, structureless bodies from 1 to 4 microns in diameter. The epithelial cells at this time present little or no evidence of degeneration. The bodies, one or more in number, lie in vacuoles in the cells. The vacuoles are at first little more than the enclosed body. These bodies increase in size, and evidence of structure, consisting of granules more distinctly stained lying in definite spaces, begin to appear. A definite nucleus has not yet been made out in them. Segmentation takes place, finally leading to the formation of small round bodies about one micron in diameter. These changes are best seen, according to the authors, in the acute hemorrhagic cases. They may also be seen in the advancing edge of a young vesicle.

These bodies the authors regard as living organisms, and the gradual growth and final segmentation, as a cycle in its life history. Further stages in the life history are described. Thus at the period of segmentation and when most of the intracellular bodies have disappeared, small, round, oval or ring-like bodies appear in the nucleus. These increase in size and acquire a definite structure, consisting of a series of vacuoles round a large central vacuole. One or more of these bodies may appear in a single nucleus. The bodies become larger, the nuclear rim grows less distinct and finally disappears, and the body lies in a completely degenerated cell, or this breaks down, setting free the body. This intranuclear body is regarded as a further stage of the development of the intracellular body and a second and complete cycle of development. It develops from the spore like bodies produced by the segmentation of the intracellular bodies which pass into the nucleus. The spores which are formed from this segmentation are considered the true infecting material of variola.

It is further interesting to note that a complete cycle of this organism, which corresponds to the primary cycle of the small-pox organism, has been traced, but that in vaccinia of calves only one-half the cycle is present. In the monkey, however, lesions are produced which are regarded as the equivalent of small-pox, and in these both the intracellular and intranuclear cycles are found occurring in the same sequence as in man.

It is true that for a number of years numerous bodies somewhat similar to these described by the authors have been found by other investigators and time alone is going to determine for us whether the organism of Councilman is the true organism of small-pox, but from the evidence presented in the article referred to and specimens demonstrated at a recent meeting of the American Association of Pathologists and Bacteriologists, it would seem that a great step forward had been taken in the study of the etiological factor of this disease.

ABSTRACTS

Congenital Heart Disease in Six Members of a Family.—De la Camp (*Allg. Med. Central-Zeit.*, July 12, p. 665) showed two girls and four boys, brothers and sisters, before the Berlin Medical Society, all of whom had congenital disease of the heart. There were a systolic thrill and murmur and an increase of dulness both to the left and right. There was nothing pointing to previous endocarditis, and the symptoms which were more marked in the girls than in the boys, were probably due to persistence of the ductus Botalli. As is frequently the case in congenital heart disease, there were other signs of developmental arrest or of degeneration. Thus both girls had suffered from epileptiform convulsions, and one boy had narrowly escaped idiocy. The family history was unimportant.

Treatment of Diphtheria by Intravenous Injection of Antitoxin.—D. Louis Cairns (*Lancet,* Dec. 20, p. 1685) says that anti-sera differ from drugs in that large doses—from 20,000 to 80,000 units—appear to produce no ill affects beyond rheumatoid pains and urticarial or erythematous eruptions. It seems to be difficult, if not impossible, to give an overdose of antitoxic serum. In the cases described below, notwithstanding the large doses employed, the amount of albumin in the urine was not increased. On the contrary, it usually was less than in those in which smaller doses were given. Experience in the City of Glasgow Fever Hospital, Belvidere, suggests that even a further fall in mortality than that effected by the introduction of the diphtheria antitoxin may be hoped for. This improvement may be effected by (1) the exhibition of larger doses than those commonly recommended, and (2) the intravenous use of the remedy. The latter does not appear to have been previously recommended. In plague the writer has by the intravenous use of Yersin's serum as an adjunct to subcutaneous injection obtained encouraging results in apparently hopeless cases (*Lancet,* June 22, 1901, p. 1746). Subcutaneous injection is followed not only by a marked antitoxic effect, as evidenced by improvement in general symptoms, but when introduced into the lymphatic drain towards the bubo a directly bactericidal effect can be demonstrated, the organisms contained in the bubo soon showing evidence of degeneration. But, even in large doses, however, the effect appears to be chiefly local, degeneration occurring only in those organisms which lie within the area of injection. By intravenous injection the maximum influence is obtained with greater rapidity. The bacilli and toxin in the general circulation can be reached directly.

Diphtheria presents a distinct analogy to plague inasmuch as the bacilli appear to be confined at first to the seat of primary infection, the symptoms being due to the toxin absorbed in the circulation. In plague, on the other hand, there is a marked tendency to dissemination of the organisms and the disease may finally manifest itself as plague septicemia. In diphtheria this tendency has been overlooked until recently, but in exceptional cases the bacilli enter the circulation and so invade the deeper organs. Councilman, Mallory, and Pierce took cultures from the heart's blood, liver, spleen, and the kidney in 153 fatal cases of diphtheria. In the blood they found the bacillus 7 times, in the liver 30 times, in the spleen 19 times, and in the kidney 27 times. In a series of 12 consecutive necropsies, Kanthack discovered that an escape of the organisms into the general circulation had occurred 9 times.

Infection of the lungs takes place by direct extension along the air passages from the primary seat of infection, producing diphtheritic broncho-pneumonia. The amount of toxin then circulating in the blood must be considerable and the immediate introduction into the circulation of large quantities of antitoxin is indicated.

Diphtheritic bronchitis or broncho-pneumonia is perhaps the most frequent cause of death after tracheotomy and when marked, recovery seldom occurs. Its diagnosis is difficult. The urgent condition of the patient impedes examination of the chest. Even when examination is attempted the information derived—apart from dulness to percussion, which is seldom found—is not of much value on account of the obstacle which the loud laryngeal sounds present to auscultation. The presence of this dangerous complication, however, may generally be inferred if the breathing is unusually rapid and shallow. Its presence is certain if, after tracheotomy, the dyspnea continues unabated, lividity in place of disappearing steadily increases, the pulse continues to rise in frequency, and a discolored muco-purulent secretion lodges in the lumen of the tube. In such cases, when the prognosis was apparently hopeless, intravenous injection of antitoxin has given the writer encouraging results.

Case 1. A girl, aged two, was admitted on the fifth day of illness with a history of severe dyspnea and stridor lasting 36 hours. She was pulseless and apparently moribund. The extremities and general surface were cold and livid. The lips were swollen and cyanotic, the face was puffy and greyish-white. The heart was beating 185 to 195. The laryngeal obstruction was almost complete and retraction of all the yielding parts of the thorax was great. Inspiratory stridor was not pronounced, partly no doubt on account of the rapidity and shallowness of the respirations (from 50 to 60), but chiefly as a result of extreme laryngeal stenosis. On opening the trachea much dark, chocolate-colored, mucopurulent secretion, with several pieces of membrane, was ejected. After insertion of the tube she breathed easily but more rapidly than before (from 70 to 174). The lividity was not appreciably diminished. As there was now evidence of widespread bronchopneumonia of both lungs 26,000 units of serum were injected into the right median basilic vein. She slept soundly for several hours, and the pulse, though still between 170 and 180, could be readily counted. During the night she was exceedingly restless. Next morning the respirations had increased to 90 and the pulse to 190, and occasionally even to 200. The hypodermic injection every 6 hours of 2 gr. of caffeine and 3 m. of liq. strychninæ had a most beneficial influence on the pulse. The urine was loaded with albumin. She had again a restless night, but next morning there were decided signs of improvement—disappearance of the poisoned look, a diminution in the lividity, and slowing and steadying of the pulse. Copious muco-purulent discharge from the tube took place. From this point she rapidly improved.

Case 2. A boy, aged two, was admitted on the fifth day of illness with a history of severe dypsnea and stridor for 2 days. The face was pale yet cyanosed and the lips and finger-nails were almost black. The pulse was flickering and hardly perceptible, while the cardiac action was so rapid that its rate could not be counted. He was very rickety, with marked enlargement of the epiphyses and great deformity of the chest. Tracheotomy was performed but immediately after the skin incision the breathing stopped. The trachea was rapidly opened and a large membranous cast was extracted with a feather. After prolonged artificial respiration he began to breathe spontaneously and rallied slowly under the influence of subcutaneous injections of ether and brandy administered by the rectum. In view of the malignant character of the case recovery was not considered likely. On account of the extreme feebleness of the circulation no veins could be seen in any of the limbs, and attempts to find one by transverse incision at the bend of the elbow failed on both sides. There was, in fact, no bleeding of any consequence. The external jugular was then defined and opened and 30,000 units of serum were injected intravenously. The wound was closed with collodion. No anesthethic was employed. He slept soundly for several hours and the pulse fell in 9 hours from between 180 or 200, to 150. The respirations, though easy, were very rapid, numbering between 60 and 70, and the secretion from the tube was copious and muco-purulent. On the third day the respirations fell to 40 and the pulse to 140. Recovery followed.

Case 3. A girl, aged three, was admitted on the eighth day of illness with advanced laryngeal dyspnea. On the right tonsil was a large patch of membrane. The pulse was rapid and irregular and the respirations were between 30 and 40. The patient had a profoundly toxemic appearance. Ten thousand units of serum were injected subcutaneously and she was placed in a steam tent. Several hours after admission she was seized with violent dyspnea. The face rapidly became cyanosed and after three or four abortive attempts at inspiration she suddenly fell back on the pillow apparently dead. As voluntary breathing stopped, artificial respiration was performed by the nurse. The trachea was opened and a large piece of membrane was extracted. A further dose of 21,000 units was given intravenously. Within 24 hours the pulse had fallen from 160 to 120, the toxemic appearance had completely passed off, and the mucous membranes had assumed their normal rosy color. Convalescence was protracted by extensive broncho-pneumonia and severe nephritis.

Case 4. A girl, aged four, was admitted *in extremis* suffering from almost complete laryngeal obstruction. The lips were almost black and the skin generally was covered with dark cyanosed areas. The pulse was hardly perceptible and could not be counted. The respirations were 36. Tracheotomy was performed and a large piece of membrane was removed from the trachea. Thirty-four thousand units of serum were injected intravenously. She was very restless and the respirations steadily increased from 36 to 66 in the evening, when it became apparent that there was severe broncho-pneumonia. A paroxysmal cough produced emphysema of the neck and upper chest. The tube, in spite of constant spraying, continued dry till the following evening, when a profuse secretion, at first mucous and later mucopurulent, began to flow from it. From this point improvement was continuous.

In these four cases broncho-pneumonia was present when the patients came under observation. In the following case broncho-pneumonia supervened after the administration of serum subcutaneously, and rapidly disappeared after intravenous injection.

Case 5. A girl, aged five, was admitted on the sixth day of illness suffering from laryngeal diphtheria with dyspnea and retraction of the soft parts of the chest. The dyspnea was not so urgent as to warrant tracheotomy. The pulse was from 150 to 160, small, very irregular at times, and of low tension. The respirations varied between 32 and 38. The face was slightly cyanosed, but cyanosis was more marked in the lips and nails. Eighteen thousand units of serum were injected subcutaneously and she was placed in a steam tent. Temporary improvement, lasting about 36 hours, followed, but on the third day after admission the dyspnea recurred with increased severity. Next day the temperature was 102° and both pulse and respiration steadily rose. The retraction of the chest was so extreme, the lividity, not only of the face and extremities but also of the body generally, was so pronounced, and the restlessness, cachectic look, and anxiety of countenance were so urgent as to necessitate immediate tracheotomy. Shortly before operation the pulse, which had been between 170 and 180, rose so that it could not be counted and the respirations increased to from 50 to 60. As the physical signs indicated widespread infection of the lungs 22,000 units of serum were injected into the right median basilic vein immediately after tracheotomy. With the introduction of the tube the paroxysms of coughing ceased and the patient slept soundly for several hours, though the mucous membranes still showed some lividity. A few hours after operation a small membranous cast was coughed up, but as yet no secretion escaped from the tube. Twenty-four hours after the intravenous injection the toxemic appearance had vanished and profuse fetid mucopurulent secretion commenced to flow from the tube. From this point the patient steadily improved.

Another class of case which seemed to call for this method of treatment was what may be termed the "malignant type," of which the following case is an example.

Case 6. A girl, aged eight, was admitted on the fifth day of illness with a history of sore-throat and swollen glands of four days' duration. The face was pale and the skin generally was blanched. The eyes were heavy and listless and the expression was languid yet apprehensive. The symptoms indicated profound toxemia. The breathing was somewhat obstructed and entirely oral, from great swelling of the tonsils and soft palate. The breath had a gangrenous odor and the teeth and gums were covered with sordes and tough mucus. The tongue was heavily coated with a thick brown fur overlaid with foul secretion, on removal of which a dry parched surface was exposed. On removal of a quantity of decomposing secretion and gangrenous tissue, both tonsils were found greatly enlarged and covered with thick felty layers of decomposing greyish-black membrane which also covered the whole of the soft, and the greater part of the hard, palate. The left tonsil already showed signs of disintegration, whilst from the free edge of the soft palate the membrane hung in ragged fringes. The uvula was completely encased in a glove-like process of membrane continuous with that covering the soft palate. The submaxillary and cervical glands formed a large hard acutely painful mass, completely filling out the hollow of the neck. There was a thin serous discharge from both nostrils, which caused considerable excoriation of the upper lip.

The pulse was from 120 to 130 and irregular in force. On account of the extreme degree of poisoning 30,000 units of serum were injected into the left median basilic vein. Extension of the membrane and the symptoms were checked. Portion of the soft palate and left tonsil became gangrenous. No paralysis followed.

Some of the most obvious results of intravenous injection are: (1) Rapid disappearance of the signs of toxemia; (2) in malignant cases rapid disappearance—sometimes in the course of three or four days—of great glandular enlargement; and (3) in pneumonic cases marked diminution of the distressing restlessness. Soon after the injection the patient falls into a quiet sleep, and though the breathing may become rapid and shallow yet previous pulmonary distress disappears. Although the intravenous injection of serum was chiefly relied upon, ordinary adjuvant measures were not neglected. Local disinfection of the throat was systematically carried out and, as a rule, laryngeal cases were kept in a moist warm atmosphere for 48 hours or longer.

The cases related formed part of a series of 50 consecutive cases. Though these were unusually severe, the mortality was 6 per cent, compared with 10.7 per cent for the previous year. The three deaths which occurred were due to (1) malignant diphtheria, (2) paralysis complicated by chorea in the sixth week, and (3) double broncho-pneumonia in a marasmic child, aged two. While the percentage of tracheotomies was greater than that of the previous year—34 per cent as compared with 25 per cent—the mortality after the operation shows a striking reduction—viz., 5.8 per cent in place of 34.7 per cent. Of the cases of tracheotomy no fewer than 12 were complicated with broncho-pneumonia, which makes the rate of recovery all the more remarkable. Serum rashes occurred in 70 per cent of the cases. It generally appeared about the ninth day after injection and lasted about three days. The dose employed subcutaneously varied from 4,000 to 20,000 units, and intravenously from 20,000 to 35,000 units. The largest amount injected was 82,000 units in three separate doses. Despite the large quantities employed no untoward results beyond the usual serum rash, pyrexia, etc., were observed.

The general indications for intravenous injection were considered to be the following: (1) malignant forms of the disease —*i.e.*, those characterized by hemorrhage from the nose or into the skin, great glandular enlargement with marked cellular infiltration, and extreme blanching of the skin; (2) marked involvement of the lungs; (3) a moribund condition on admission; and (4) a profoundly toxemic condition. In all such cases an initial dose of from 20,000 to 25,000 units is not excessive, and if in twenty-four hours the patient fails to respond to the treatment, as indicated by persistence of the signs of toxemia, continued rise of temperature and increased frequency of pulse and respiration-rate, and an extension of the membrane, the dose may be repeated.

Sporadic Cretinism in Children.—Rosa Engelmann reports in the *Journal of the American Medical Association,* to whom we are indebted for the loan of the illustrations, the following interesting cases of cretinism:

Terminology.—To J. Hilton Fagge, in 1871, belongs the credit of distinguishing sporadic from endemic cretinism and assigning to it the name sporadic cretinism. Jacobi was the first in America to present a sporadic case to his colleagues. Townsend and Lloyd, respectively, published "A Case of Congenital Cretinism" and "Sporadic Cretinism" before Osler's comprehensive monograph on this subject appeared in 1893. In 1897 Osler had collected 60 cases in America. Bullard, Booker, Rotch, Fruitnight, Northrup, Peterson and, most conspicuously, Koplik have augmented the literature with a special reference to the incidence of this disease in infancy and childhood. Heubner recently raised the point as to a more suitable name for this disease when occurring in early life. He protests against the term myxedematous idiocy, since neither relative nor absolute idiocy need accompany the infantile form of this disorder. I agree with him on this score, and on the further ground that pronounced myxedema may likewise be wanting, and that idiocy and cretinism are terminal and preventable states, dependent on absence of or disease of the thyroid gland. Hence close reasoning and expression requires that this disease in childhood be called "sporadic, infantile, congenital and acquired athyrea," or "sporadic, infantile, congenital and acquired myxedema," and that the terms "sporadic cretinism" and "myxedematous idiocy" be confined to the untreated and adult cases.

Etiology.—Heredity seems to be a factor in the adult form. Its influence has not been determined in the infantile variety. Scanty statistics with reference to sex, nationality, climate and country on this subject prevent conclusions as to their etiologic import.

There is a growing belief as to the infectious origin of this disorder, but proof is still lacking. Myxedema is an infrequent but acknowledged sequel of such infectious diseases as typhoid, rheumatism, syphilis and erysipelas. What it is, however, that causes absence of anomalies and disturbed function of the thyroid gland and the consequences of the same, is not determined. Experimental work is being done and the importance of the parathyroids in the human dwelt on. The latter are known to develop in advance of the thyroid lobes and to be concerned in the nutrition of the general nervous system and in the regulation of the cerebral circulation.

Differential Characteristics.—The landmarks or differential characteristics of this disease in infancy and childhood are first and foremost:

1. Absence of atrophy or disease of the thyroid gland.
2. Mental torpidity and physical backwardness.
3. Weak musculature.
4. Paleness, puffiness and dryness of the skin with later a thickening and inelasticity of underlying tissue.
5. Abdominal distension.
6. Constant existence of umbilical hernia, that disappears promptly on thyroid feeding. Parker and Sargent call attention to this defect that in histories, at least, is overlooked, but always illustrated in the pictures of cretins, they say.
7. Obstinate constipation.
8. Not a retarded but a rudimentary dentition, evolutionarily parallel to that of a normal child of the same length or height as the cretin.
9. A brachycephalic skull and a general skeletal arrest more marked in the long bones; a dwarfism, due to slow enchondral and osteal diaphyseal progression, but not to an epiphyseal cartilaginous hyperplastic growth and an excessive deposition of the bone cells as seen in rickets. The process is a slow, lineal, symmetric delay of ossification rather than an epiphyseal and periosteal overgrowth.
10. A radiographic verification of this fact, demonstrating the parallelism and symmetric development of the long bones of the cretin as compared to that of a normal child of corresponding height, but not of corresponding age.
11. A radiographic exhibition of the absence of partial or backward evolution of the small bones of the hands contributing with the associated shortening of the phalangeal and metacarpal bones to the spade-like appearance of the hands.
12. The presence of Koplik's stigma of degeneration, viz., an excessive prominence of and over the os pisiformis separating the wrist crease from the antithenar prominence. Koplik does not believe that this deformity is consequent on pressure from crawling, since he has seen it in a three-months-old babe.
13. Diminution of the white and red blood corpuscles and the hemoglobin percentage. A progressive anemia.
14. Small heart, slow and almost impalpable pulse, cold and mottled surface, subnormal temperature.

15. Suprascapular and supraclavicular and other connective tissue or colloid pads. See Figs. 1, 2 and 3.

16. Hoarse, low-pitched cry and voice.

17. Peculiarities of posture and gait manifested when standing by a broadened base and by a swaying of the body when the feet are brought together, with closed eyes and by a sluggish gait.

Correlation of Thyroid, Thymus and Pituitary Gland Functions. Kocher was the first to indicate the direct influence of the thyroid gland on bone and blood formation. Virchow, in 1853, announced that dwarfism of rickets took place after the disease process had ceased and was a result of premature ossification. Bourneville, in 1890, Telford Smith and Horsley, in 1896, and later Hellier and Hertoghe experimentally and histoligically proved that the skeletal changes of cretinism were absolutely opposed to those of rachitism.

Klebs had already noted the lack of distinct zones of ossification in the long bones of cretins. Feldman, Hofmeister and Eichelberg, in a very recent experimental and histologic work, demonstrate a distinct cartilage atrophy or dystrophy, as a result of thyroidectomy in dogs. These microscopic specimens showed a distension and separation of the epiphyseal cartilage with dissolution of its ground substance and formation of vesicles with shrinkage and destruction of the cellular elements. Mikulicz and Quincke are of the opinion that the offices of the thyroid and thymus glands are intimately correlated. The diminution of the leucocyte count in athyrea, and a preponderating number of persistent thymus glands at the autopsies of cretins would seem to indicate such a correlation. Ord and Mackenzie describe enlarged thymus glands at the postmortems of all cases of Graves' disease observed by them. Hektoen, in his exhaustive work on this subject, concludes that the coexistence is more than accidental.

Some unknown connection between the pituitary body and thyroid gland is assented to by Ponfik and others, and the hypophysis cerebri is supposed to act compensatorily in diseases of and absence of the thyroid gland. Packard's postmortem of a child cretin revealed an enlarged pituitary gland, calcareous degeneration of thyroidal and cerebral vessels, a cerebral abscess, fatty liver, granular spleen and swelling of cardiac muscle.

A section in Quincke's case of acquired myxedema, in which at the sixteenth month the thyroid was pea-sized and had vanished at the fourth year, revealed atrophy of the thyroid, diminution in size of the pituitary and smallness of the thymus glands. In another postmortem on a three-year-old child, which had suffered from acquired myxedema, the thyroid was replaced by fibrous tissue; the hypophysis was much congested and showed areas of increased cystic formation.

Ponfik's observations and the histories of a few cases suggest the common heredity of acromegaly and myxedema. A father is cited to have been suffering with acromegaly and a daughter subsequently with acquired myxedema. Another instance is that of a father becoming acromegalic fourteen years after the birth of a cretinous daughter, whose dulness and dwarfishness were not noticed until her fifth year.

Sternberg gives the following points of similarity between the two disorders: The tongue of cretins is often large, the lips puffy and thick, the nose snubbed and short. Long bones in cretins are thick and short. The jaws of both acromegalics and cretins are prognathous. An enlarged sella turcica is found in skull of both and frequently a hypertrophied hypophysis. Indolence in both is marked and the skin of the back of the hands of acromegaly is much like that of myxedema. In acromegaly the thyroid gland is abnormal when examined histologically. An overgrowth

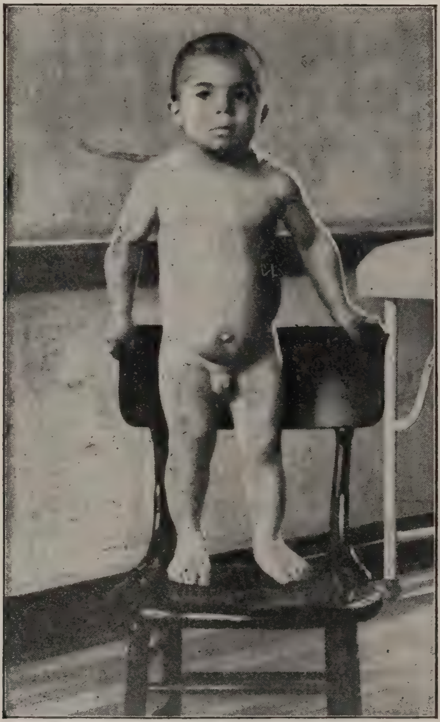

Fig. 1.

of the hypophysis has been discovered to compensate for loss of thyroid function.

Relevant to this question of associated and correlated function are the physical and clinical findings in cases of dwarfism, gigantism, asymmetric myxedema, acromegaly, micromegaly, scleroderma, etc.

Opinion is unanimous as to the benefit of thyroid feeding and as to an improvement proportional and constant according to its early institution and continuance. A perfect mental and physical restoration is thus dependent on a timely diagnosis and the establishment and continuation of this medication. Koplik and others assure us that the most rapid and brilliant effect takes place within the first six weeks of treatment. This apparent mental and physical growth spurt is a probable "making up for lost time," that settles down to a gradual evolution similar to that of the normal individual, so soon as the cretin's skeleton conforms

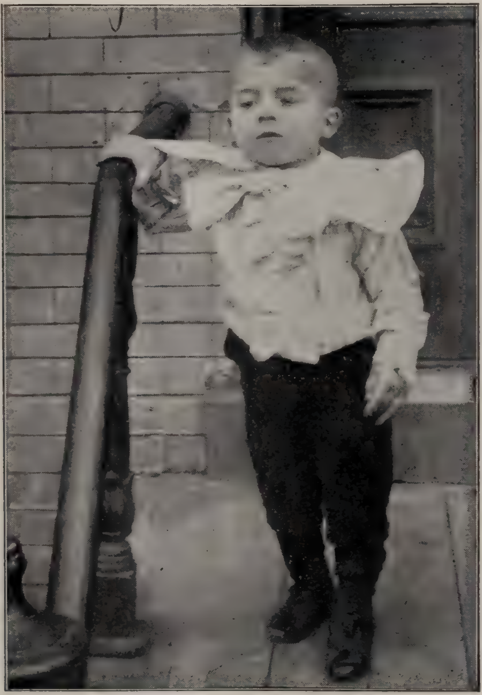

Fig. 2.

to or catches up to that of a normal child of corresponding height. Ewald, Thompson and others believe, however, that continuous treatment causes a uniform growth and intellectual progression. The following table of two of Ewald's cases illustrates this belief:

Girl eight and a half years old, disease noticed at fourth month.—June 29, 1890, 31⅞ inches in height; March 19, 1891, 32⅛ inches in height; Jan. 8, 1893, 34½ inches in height, began thyroid feeding; Feb. 13, 1893, 35½ inches in height, grown 1 inch in 1 month; June 30, 1893, 36¾ inches; Feb. 8, 1894, 38½ inches in height; May 11, 1895, 42½ inches in height; March 8, 1898, 46 inches in height, normal of eight and a half years old.

Seven and a half year old girl, disease since birth.—Aug. 16, 1894, 30 inches in height; Oct. 4, 1894, 31¼ inches in height; Nov. 7, 1894, 32 inches in height; Dec. 17, 1894, 33½ inches in height; May 9, 1895, 36½ inches in height; May 21, 1898, 46¼ inches in height. Showing gradual continuous growth through four years of treatment.

The Author's Case.—Thompson's patient was not thyroid fed until her third year. At her fifth year she outclassed her normal schoolmates of the same age. My patient did not regularly receive thyroid feeding until his seventh year, and his growth progression compares favorably with Ewald's cases. While mental and physical betterment is marked it is not commensurate to his skeletal improvement. As a matter of experiment he was placed on pituitary gland extract, and thyroid extract was omitted, when a general mental and physical retrogression was noted with, however, a decided accession of long bone growth. On the restoration of a regular morning dosage of thyroid gland extract and the continuance of an evening dosage of pituitary gland extract the child returned to his normal state, and still continues to improve, although he does not yet approximate to the normal of an eight-year-old, but rather about that of the normal for a three-year-old. (Since this was written he has grown an additional inch and a quarter in three months.) The history of my patient is as follows: Benjamin L., seven years one month old, weight 39⅜ pounds, height 2 feet 11 inches. About normal for a three-year-old child. Was a nursling. Born at full term in America, of Russian parents, not related. One of eight children, one of whom is paraplegic. No family history obtainable. The mother has a medium-sized parenchymatous goiter, unaccompanied by symptoms. Has been, and is, a healthy woman. She noticed that this child was unusually cold and pallid at his ninth month, and that he did not act as a child of his age should. He was obstinately constipated from birth and had a pot belly without umbilical hernia or signs of rickets. Did not sit up until after his first year and did not walk until the middle of his third year. No eruption of teeth until after the first year, and the anterior fontanelle was not closed until his fourth year. Survived croup at his sixth week, and passed through attacks of measles, scarlet fever, diphtheria and pertussis. Began to talk imperfectly in a low-pitched, hoarse voice during his fourth year, and until he was

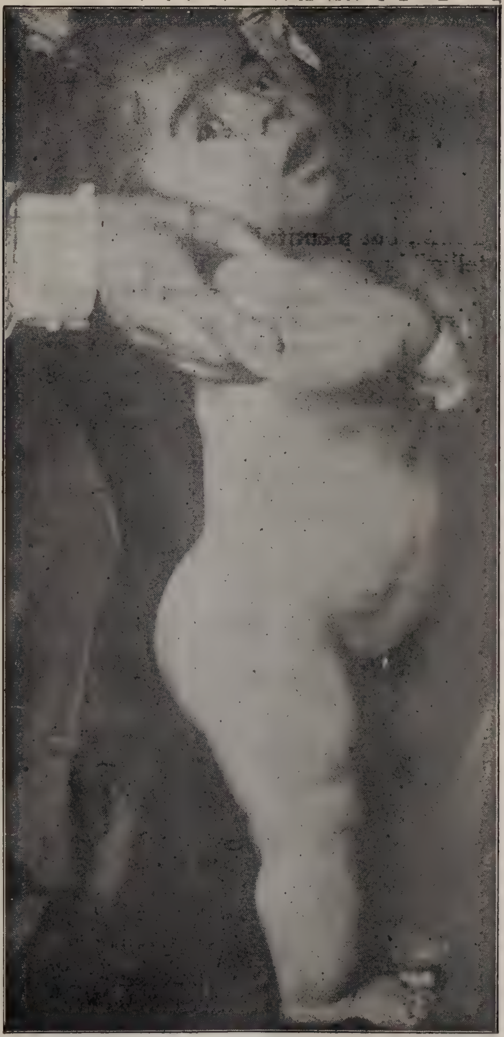

Fig. 3.

placed under treatment; suffered also from incontinence of urine and feces. At three and a half years, after which for a short time he was placed on thyroid feeding, he presented the typical signs of a myxedematous idiot. See Figs 1 and 2. When first seen by me at his eighth year he was dwarfed to the size of a three-year-old child; walked with waddling gait and stood with a broadened base, clinging to something for support. He swayed when he closed his eyes. His head was too large for his body. He presented a stolid, unintelligent, bloated, ashy countenance, with wrinkled forehead, flattened, broad, thick nose and thick lips, behind which were the decayed, deciduous teeth. His hair was slightly roughened, but plentiful. When asked his name he huskily and unintelligibly muttered it. There was mental apathy and slowness of speech. His neck was short and thick. His skin was so harsh and dry that, on removel of his clothes, the scales showered about him. He was cold to the touch and the skin was mottled. There was also thick, boggy, subepidermic infiltration more pronounced on the extensor surfaces of the extremities; and supraclavicular and suprascapular colloid pads. They also existed on the dorsal surfaces of the feet and hands. The temperature was 98, pulse 76, hardly palpable over the radial artery; the respiration 22 per minute. Heart small and apex beat hardly palpable or perceptible. Lungs normal. Thyroid impalpable, absent. Spleen and liver normal; pendulous abdomen; small, shortened and thickened extremities. Upper and lower extremities without other deformity except fatty tumors of the dorsum of the feet and hands. After two weeks' thyroid feeding he began to look and act more intelligently. No albuminuria, no glycosuria. See Fig. 4.

That anemia is a pronounced characteristic of cretins is proved by his blood examination made May 3, 1902: Hemoglobin, 65; corrected, 71; no poikilocytosis; reds, 3,993,600; no leucocytosis. Differential count: Small lymphocytes, 23 per cent; large lymphocytes, 28 per cent; indented lymphocytes, 2 per cent; polymorphonuclear eosinophiles, 3 per cent.

Synopsis of history and treatment.—First seen March 27, 1900; 3 feet in shoes, 2 feet 11 inches in bare feet; aged seven years one month; weight 39 3/8 pounds. March 30, began treatment. May 11, 2 feet 11¼ inches; grown ¼ inch; weight, 35 pounds 10 ounces; lost 4 3/8 pounds; abdomen less prominent, fatty tumors disappearing, talks plainer, countenance brighter; given 3 grains thyroid extract, t. i. d. May 15, 2 feet 11¼ inches; weight, 34¾ pounds; temperature, 99; shows a little color in ear tips and cheeks (before this ashen white). May 24, 2 feet 11½ inches; weight, 35 pounds; has grown ½ inch; temperature, 99.2; disappearance of incontinence of urine and feces; given

4 grains, four times a day. June 14, 2 feet 11¾ inches; weight, 34½ pounds; has lost ¼ pound, gained ¾ inch in height; temperature, 100.8; walks better, talks plainly, color in cheeks and lips; temperature above normal; urine normal. July 24, 3 feet ½ inch; weight, 29½ pounds; has lost 5 pounds, and for the first time in his life perspired during hot weather. July 27, weight 32 15-16 pounds; can stand with a firm base, without grasping something for support; no longer sways on closing eyes; can bring feet together; runs easily; skin moist; temperature, 99.8;

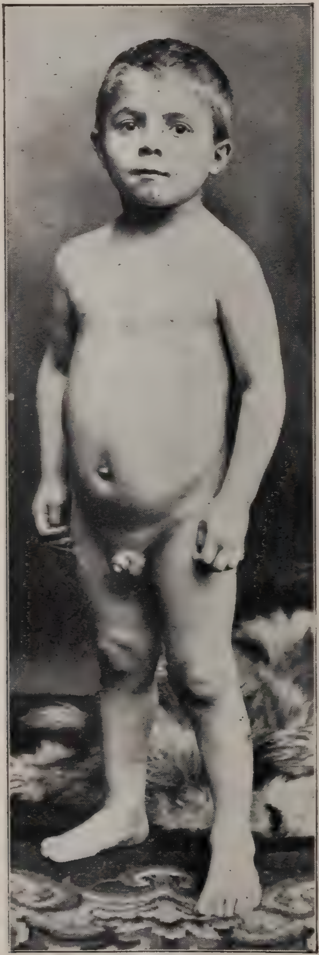

Fig. 4.

urine, no sugar or albumin; pulse perceptible; reduced thyroid extract to 2 grains, a. m. and p. m.; no symptoms of thyroidism except a slight rise in temperature. October 2, 3 feet ½ inch. Weight, 36¼ lbs. Had intermittent feeding during summer and passed out of observation until October 2, when he had gained in weight, but had not grown any. Skin again rough and scaly; abdomen enlarged, reappearance of supraclavicular pads; (eruption of one permanent molar and cuspid). Thyroid extract, 3 grains t.i.d. Oct. 26, 3 ft. ⅝ in. Weight, 38¼ lbs. Grown ⅛ in.; total gain, ⅝ in. Nov. 30, 3 feet ⅝ in.; weight, 38 pounds, temperature, 100; pulse, 88; thyroid, 2 grains, t.i.d. until January 24. January 24, 1902, 3 feet 1½ inches; weight, 37¾ pounds; grown ⅞ inches in this interval, or total of 1½ inch; hemoglobin, 66.57; more intelligent, talks quite fluently in low voice, color in cheeks, lips and ears; skin not so dry or harsh; urine normal. February 26, 3 feet 1½ inch; weight, 37¾ pounds; stopped thyroid gland extract. March 5, 3 feet 1¾ inches; gave pituitary gland extract, 1 grain morning and evening, as an experiment on growth. April 19, 3 feet 2 inches—¼ inch gain; weight, 38¼ pounds—½ pound increase; intercurrent bronchitis; suprascapular pads reappeared, skin dry and harsh, he looks loggy; abdomen prominent, constipated; grew ¼ to ½ inch in a little less than seven weeks, but mother said child retrograded decidedly in every respect; gave thyroid, 2 grains, morning, and pituitary gland extract, 2 grains, evening; temperature, 100. May 15, again became thinner, skin moist; temperature, 99.2; fatty tumors disappeared, abdomen smaller, limbs more symmetrical; appeared bright; permanent incisors cut; greater growth symmetry and intelligence; he is still dwarfed, as I believe he always will be, since regular treatment was instituted too late for a perfect restoration. (Since writing the above the boy has grown 1¼ inches and has become more intelligent.)

Absence of Knee-Jerk in Croupous Pneumonia of Children. M. Pfaundler (*Münch. Med. Woch.*, July 22, p. 1211) found that the knee-jerk was sluggish or abolished in 55 out of 200 cases (27.5 per cent) in children under the age of ten. The phenomenon appears to have no relation to the degree of pyrexia or the presence of delirium. In broncho-pneumonia the knee-jerk is normal. In croupous pneumonia it is frequently unobtainable before there are any local pulmonary signs. The absence of knee-jerk is more frequent than the occurrence of herpes labialis, and may be a diagnostic aid in doubtful cases. H. Lüthje (*ibid.*, Aug. 12, p. 1349) confirms this statement, with the modification that the absence of the knee-jerk may occur in croupous pneumonia at all ages (Pfaundler is a physician to a children's hospital). He is doubtful as to its diagnostic value, however, as sluggishness or complete abolition of the tendon-reflex is not uncommonly present temporarily during all kinds of infective diseases.

Insusceptibility to Vaccination of Infants whose Mothers were Vaccinated during Pregnancy.—F. G. Wallace (*Brit. Med. Jour.*, Nov. 29, p. 1743) vaccinated a woman seven months pregnant who took well. The child was vaccinated in the first month and also took well. J. L. Stretton (*ibid.*) vaccinated a woman four months pregnant. The child was vaccinated in the first week and did not take. It was again vaccinated with active calf lymph when three weeks old without success. At the age of three months it was again vaccinated. Only one of the places took, but it was a large one and the result was excellent. The case seems to show that the vaccination of the mother during pregnancy has a distinct effect upon the child, but that it does not render it proof against vaccination. H. V. Rakse (*ibid.*, p. 1744) in July revaccinated a woman seven months pregnant. The baby was born in September, and when a month old was vaccinated with lymph that was active in other cases. The arm did not take. At the age of a year vaccination was again performed and four mild vesicles, leaving very slight scars, resulted. G. C. H. Fulton, M.B. (*ibid.*) has found it almost impossible to obtain vesicles in infants whose mothers were vaccinated during the pregnancy. But these insusceptible children can all be successfully vaccinated at the age of eighteen months or two years.

BOOK REVIEWS

THE PERVERTS. By WILLIAM LEE HOWARD, M.D. G. W. Dillingham Company.

In "The Perverts," by William Lee Howard, M.D., we have one of the strongest pieces of recent medical fiction. A novel dealing with various phases of mental and moral perversion, it is dedicated to Edgar Allen Poe "in recognition of his struggle with a psychic incubus."

The principal characters, a moral pervert and a dipsomaniac, are powerfully drawn objectively, and then keenly analyzed subjectively, psychically, with all their symptoms minutely described, and every cause through three generations of antecedents taken into account, so much so that they might well seem exaggerated but the author in his preface assures us that his characters are drawn from his personal experience and moderated rather than exaggerated, so as to make them presentable.

The book is a strong plea for more rational treatment of the neurotic, for quicker recognition of these cases on the part of medical men, and for more humane treatment by society in general. In the words of the author "it is the organic, physiologic matter-of-fact conditions existing through heredity, plus the environments and education, which determine the moral and immoral character of the individual, and any attempt to correct a pathologic condition through persuasive appeals to unknown powers is a humiliating exhibition of superstition and ignorance of nature's laws." This is the theme of the book, to approach the degenerate and the pervert from a material, physiologic viewpoint and not as proper subjects for a religious or sentimental appeal. As in the case of Poe, to regard his inebriety as the result of his dipsomania, not as the cause of it.

During the course of the story many interesting digressions are made into related subjects such as religious hysteria and the various manias in the great men and women of history, a condemnation of certain phases of charity organization work, and a good round denunciation of the "new woman" as contrasted with the normal mother. The book is thoroughly interesting from beginning to end, and is recommended to all interested in the peculiar morbid states presented by neurotics and the problems they entail for modern society.

PEDIATRICS

VOL. XV. JULY, 1903 No. 7

ORIGINAL ARTICLES

FRESH AIR IN THE TREATMENT OF CHILDREN'S DISEASES.[1]

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The air which we breathe has a certain chemical composition which is quite definite. Thus it contains 20.9 per cent oxygen, 79 per cent nitrogen, and small quantities of ozone, carbon dioxide and certain other gases. Ozone is a particularly powerful molecular form of oxygen and is desirable. Carbon dioxide is the result of oxidation and besides being irrespirable itself for any length of time is a measure of other objectionable contaminations. Fresh air should not contain more than 3.5 or 4 parts of carbon dioxide to 10,000 of air. Fresh air, moreover, should contain free ozone. Not that the ozone is of great value to the economy itself but it indicates that there is not present any considerable amount of oxidizable material, just as carbon dioxide indicates the reverse. Fresh air will not exist near large amounts of vegetable matter which are being changed into organic gases. More rarely fresh air is contaminated by mineral gases, as for instance, in the neighborhood of smelters and reducing works. Some of these gases are deleterious, others seem to have a beneficial effect upon animal life.

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[1] Read by title at the meeting of the American Medical Association at New Orleans, May 5-8, 1903.

Fresh air, therefore, is found best away from crowds of people whether indoors or out, in the country or, better still, near or on the sea. For it has been proven that the rapid evaporation of water is a powerful influence toward the formation of ozone.

A brief note as to the physiology of breathing will not be out of place. The nitrogen acts purely as a diluent. The oxygen borne into the air vesicles of the lungs comes in close contact with the blood stream and is picked up by the red blood corpuscles. Thence it is borne to the tissues of the body and is used to remove from the organs substances which would otherwise become powerful poisons, or it may be, merely obstructions in the life processes. If the supply of oxygen is reduced or if, instead of carrying oxygen, the air breathed brings to the blood deleterious gases, the effects are sometimes prompt and serious, and at others slow and subtle. When, through the activity of germs, poisons are being rapidly produced in the system, fresh air is specially necessary and to no one more so than to the child. For the cells of the child are many of them in a formative process and quite unable to resist the onslaught of bacterial life. Their resistance power is not yet developed, whether by that we mean the inherent protective power of the cells themselves, or the phagocytic power of certain valiant leucocytes. In a quickened pulse and respiration, nature does her best and loudly cries for fresh oxygen laden air, and for the removal of that which has been contaminated.

These conditions are precisely what do not exist in crowded institutions or households. Uusually far too little fresh air is provided and almost invariably no particular effort is made to remove the foul air. A draft is a source of great apprehension, but hot, close air, which if analyzed will show a high percentage of carbon dioxide, will be endured for hours by the attendant. A portion of this mistake is due to the failure to appreciate that we breathe through the skin as well as the lungs. Few mothers realize the advantage of the air bath to the child and the necessity of so clothing the little body that the air layer next the skin can be changed from time to time. The brisk rub in the sunlight after the bath is of much benefit, but attention to the air of the room, which should not be too warm, is equally necessary. How often have we seen the child rapidly improve in health when, clad in two little garments, with bare head, arms and legs, the sunlight and fresh air of a farm or of the seashore have free access to his skin! Who shall say, too, how much of the rugged health of the dirty little urchins of the street is due to the exposure, oftentimes esthetically excessive, of their little bodies to the air of the streets and parks? And yet, the air of the city streets and alleys, though much better than that of the adjoining houses, is often fouled by disgusting odors and dangerous gases.

To meet these conditions, efforts have been made in some cities to provide places where the little ones and specially the sick babies, whose little lives will else soon fly away, can get fresh air. Street car rides, picnics, harbor excursions, seashore and country hospitals all minister to the little ones. Perhaps nowhere has this idea been more fully worked out than in The Boston Floating Hospital.

Taking its origin in the desire of the founder to give a single day's supply of fresh air to the little ones, sick and well, who scrambled about his feet as he walked through the city streets, it has rapidly and steadily grown to its present position. Gradually the excursion element has been eliminated and the hospital features have been increased. Out of this desire of sympathetic friends to give the children fresh air has grown an institution which last year, during a season of ten weeks, cared for 690 sick babies, kept busy a staff of ten or twelve physicians and surgeons, trained a dozen medical students and twice as many nurses in the care of sick babies, taught 600 mothers the first principles of hygiene and health. And all this is fundamentally an effort after fresh air. It is expensive. That which theoretically is the most abundant and free of all our necessities, cost us really $300 per day. But the 55 or 60 little ones who lay day after day gasping in their cribs, and the equal number who being less ill were in the open air of the upper deck, and at evening were taken to their homes to return again the next day and the next, showed truly enough that fresh air is a necessity for all and a prime necessity for sick children.

Fresh air is all about. The upper deck has only an awning for protection. There is, too, a smaller ward on the middle deck where there are always exposed (?) to the open air four or five cases often evidently tuberculous. Windows on all sides are open so as not to cause direct chilling of the babies. But a further step was taken, and one in which the institution is peculiar. Many observers have noted the fact that after a period of high general humidity the death rate among babies is greatly increased. Various explanations are given. The winds usually do not blow and take away contaminations. The heat favors the bacterial growth in milk. The humidity checks the excretions through the skin and mucous membranes. At any rate the humidity on a floating hospital is not less than elsewhere and the mortality at such times for sick babies is everywhere fearful. Hence machinery was devised which takes the fresh ozone-laden air, drives it over coils filled with brine at a temperature near zero. A very large amount of water is thus "frozen out," the proportion being regulated by the cold in the coils and the rate at which the air is driven through. Such air is too cool for the wards and it is, therefore, again warmed by passing over steam pipes. We are thus able on the hottest, stickiest days of July or August to deliver to our babies an abundance of air free from contamination, laden with ozone, and at a uniform temperature of, say 68° F., and a relative humidity of 50 per cent. The resulting comfort is astonishing and the success we have had in the care of the very sickest babies in the Metropolitan District is widely recognized.

PEDIATRICS .. ORIGINAL ARTICLES 2

Other means are never neglected and hence we can not say that fresh air alone did this or that. We have the freshest milk we can get, and we know it is free from germ life when delivered to the babies, not because the germs have been killed by heat and their poisons left, but because they have never been present in the milk. For "clean milk" is a war-cry which deserves only less emphasis by the medical profession than "fresh air."

"Typhoid precautions" are observed everywhere through the boat. Fly-screens everywhere, elbow sleeves in the wards, frequent scrubbing with solutions of cyanide of mercury, prompt disinfection of diapers and destruction of the same are among the regulations.

By these methods we are able to crowd our wards with cribs and yet maintain a relatively low mortality. Doubtless we could do better if we had more space for each baby. But, while it remains true, as it was true last season, that one sick baby in three must be refused for lack of room, we must crowd. A new boat for which most earnest efforts are being made will avoid many of these objectionable features of crowding. But in the new boat, as in the old, and as always when plans for sick babies are being made, the prime requisite is plenty of fresh air.

Brookline, Mass.

FOUR DECIDUOUS TEETH EXTRACTED BY AN INJURY, REPLACED AND RETAINED IN A HEALTHY CONDITION

By Samuel E. Earp, M.S., M.D., of Indianapolis,

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It is not my purpose to consider a case which comes strictly within the domain of the dental surgeon from the fact that the situation is one of emergency in which the general practitioner is most likely to be the person summoned. The circumstances hereafter detailed will illustrate a method of procedure in accidental fractures to the deciduous teeth in which nature demonstrated her power to compensate when given an opportunity. Very meagre and unsatisfactory information upon this subject can be found in medical works and those of the dental profession refer in the main to fractures which take place in the adult; hence when the permanent teeth need attention under similar circumstances, there is an opportunity for mechanical support by means of a cast, a metallic appliance, gold or silver wire, the appropriate bandage, etc. Furthermore the reason and judgment of the adult cause obedience to instructions. In the young child we may expect a frenzied condition which will often baffle the desires of the attendant.

I have known of several instance in which children's teeth have been forced from the alveoli by accidental means, clinging by a slender piece of tissue only, and they were removed without any attempt to save them. It is equally as important to know what not to do in such cases as it is to know what to do; conservatism will frequently bring success.

May 6, 1902, I was called by Dr. A. R. White to see his granddaughter, Marion A., age sixteen months. She was seated in a hobby rocker which had the representation of a horse on either side; between the heads a round bar and below it a wooden tray which moved on an axis. During a period of violent rocking when the head was inclined farther forward than usual the four lower incisors caught between the edge of the tray and the cross-rod; during the consequent backward movement the teeth were forced from the alveoli and the labial surface of the teeth were in contact with the lower lip. The gum tissue on either side was lacerated to the alveolar margin of the maxillary bone. There was a slight attachment of tissue on the anterior surface which in this position would in reality be the under surface, so that it comprised a plate with the apices of the roots completely detached and extending over the inner margin. An elevation on each side of the wound indicated that the canines were upon the verge of eruption. There were no teeth to which a mechanical appliance could be attached. The hemorrhage was no more than would result from the extraction of several teeth. The injured parts and mouth were treated with an antiseptic solution consisting mainly of boric acid, the teeth replaced and after firm pressure for five minutes were kept in place by a pledget of cotton saturated with the same solution, but the customary head bandage was ineffectual. A combination of bromide of sodium and hydrate of chloral was given to produce quietude. The diet was liquid.

Two days later the child fell and produced the same condition of affairs as existed at my first visit. At the onset I had little confidence of success, and now much less. I proceeded as before in dressing the injury, and after a few weeks the teeth were firm, and at this date all are uniform and in a healthy condition.

The relation of the teeth to the maxilla and the cause of their vitality is a matter of interest in considering the outcome of this case. The periosteum of the alveolus also covers the tooth to its neck and at this point is continuous with the structure of the gum tissue. The central cavity which extends into the root abounds with connective tissue containing nerves and blood-vessels. A nerve and artery enters the apical foramen and ramifies all portions of the pulp, probably more abundant at the periphery, a venous system returns the blood to the general circulation. It has been said that when the pulp and its nerve and blood supply have been disconnected the pulp dies. In this case the teeth were replaced and remained in a healthy condition, which seems to indicate that a reunion took place.

From what has been said the following may be deduced:

1st. Nature even under adverse circumstances will show an inclination to compensate in case of an injury, especially when there is ample vitality as in childhood.

2d. The preservation of the teeth in this instance prevented depression which during the succeeding four to six years would have changed the expression of the features.

3d. The cutting edges not being in opposition, in fact the absence of the incisors would have made mastication imperfect and consequently an impaired digestion.

4th. The successful readjustment probably prevented a destruction of the germs of the permanent teeth and avoided a deformity and malposition.

MONGOLIAN IMBECILITY

By C. R. Spicer, M.D., of Springfield, Ill.

With a Review of Twenty-three Cases.

This subject has been chosen, not because of its importance in everyday practice; but because, occurring rarely, it is likely to be unrecognized if the examiner's attention has not been especially called to it. On the other hand it is so plain and characteristic that once seen it is never to be forgotten.

Generally speaking, imbecility in infancy and early childhood is very puzzling and difficult to classify; but this class is quite distinct.

This class of idiots is not really so small; but comparatively little has been written on the subject because the condition has not been recognized until recent years. In his edition of 1895 Rotch does not mention the subject nor does Holt in his book of 1900. It is not so rare in Europe, however, as Shuttleworth states that this class forms five per cent of all imbeciles.

The term Mongolian does not imply that this class of individuals is more common among the Mongolian race; in fact it is shown not to be so, but to the marked resemblance in appearance. This resemblance is chiefly in the shape of the head and oblique position of the eyes.

These children present a very striking and odd appearance. The head and all the features are more rounded than usual. Instead of the ordinary occipital prominence the back of the head is nearly vertical, making the occipito-frontal diameter abnormally short while the temporal diameter is relatively long. The hair is scanty, straight and fine. The skin is of a clear pink and the cheeks red. The eyes are characteristic, the palpebral fissure being oblique and with a reduplication of the epicanthic fold. The bridge of the nose is depressed, the child snuffling more or less and breathing through the mouth. Adenoids were present in 35 per cent of the cases observed. The tongue is abnormally large and usually protrudes and in early childhood becomes fissured, presenting a hacked appearance. Thompson, of Edinburgh, found this condition present in eleven consecutive cases over four years of age, but has not seen it under two. The vault of the mouth is usually high. The bones are relatively small and the joints lax so that the foot can readily be placed behind the head. The hand is short and spadelike, the little finger being relatively short and sharply curved toward the ring finger.

Development is much retarded in these cases, a child of a year often appearing not more than eight months. Dentition is delayed, the teeth often not erupting before the third or fourth year. The voice is gutteral and indistinct.

These children show many interesting and peculiar dispositions. They are affectionate and jealous, their jealousy sometimes rendering them unsafe companions for other children. Otherwise they are cheerful and good natured, and are usually clean in their habits. They are fond of music and take an interest in toys, domestic animals and such things as interest normal children.

In the two postmortems which I have seen in Mongol imbeciles the medulla was small and the cerebellum quite small, the cerebral convolutions in both instances apparently normal. In one the vomer protruded into the naso-pharynx. The apices of the lungs of one of the bodies were pneumonic, the bronchial glands were large and caseated, and the base of the brain studded with tubercles. In examining the records of five autopsies on Mongols, Muir, of Edinburgh, found the medulla and cerebellum undersized in three, while the other two were apparently normal. The blood count in three cases showed nothing unusual.

The etiology in this class of imbeciles is by no means clear. Heredity seems to play no part whatever. I know of but one instance where two of these individuals were related. They were brothers. They often occur at the end of a large family or near the menopause. That this fact plays a very important part in the etiology is doubtful, for they are often the first child and the mother young. Of the twenty-three cases observed five were from the seventh to the thirteenth child in the family while nine were from the first to the third. In nine cases the mother was from thirty-eight to forty-eight years old, and in one instance the father was twenty-four and the mother forty-three. In several instances the child was the youngest in the family by several years. Only two had a specific history, and in no case were the parents related before marriage.

The diagnosis of this type of idiocy is very easy. The only condition for which it is likely to be mistaken is cretinism. They have the following points in common: they are both short in stature, backward in development and dentition, hair scant and straight, large tongues which protrude, short thick hands, depressed noses, and are both low-typed idiots.

They differ in that the Mongol's palpebral fissures slant, he has reduplicated epicanthic folds, has red cheeks, short fingers which taper to a point, back of head straight, while large over vertex, hair fine and silky, has no fat pads and is lively and cheerful in disposition; while the cretin's eyes are horizontal, no reduplication of epicanthic folds, cheeks pale, head large behind, hair coarse, fingers square at ends, pads of fat often present and they are often stupid and morose.

Intellectually Mongols are very near the bottom of the scale. They often do not sit alone before a year, nor walk until from two to four. Some never learn to recognize the mother, while others even learn to talk.

They are very imitative and like to mimic older persons. They are helpful and anxious to do errands, taking great pride in their attainments.

Mongols are short lived. Of the twenty-three observed the oldest was eleven, while nineteen were under six. They are sensitive to atmospheric changes and very prone to lung trouble, especially tuberculosis and pneumonia. Those surviving usually become fat about puberty. In such thyroid is useful. Poynton, of London, has seen general improvement in the continued use of it, but the gain must be very slight, for one of his cases four years old, that had been under treatment a year, could barely walk, and could say but a single word.

No.	*Age.*	*No. of child.*	*Remarks.*
1	5 yrs.	1st.	See photo.
2	?	1st.	Rhachitic.
3	2 "	1st.	Rhachitic.
4	3 "	9th.	
5	11 mos.	2d	Congenital heart.

6	3 yrs.	2d	Cannot stand. Youngest by 12 years.
7	2½ "	Only.	Cannot walk.
8	2½ "	5th.	Father, 23; mother, 43.
9	11 mos.	?	Has head nodding. History specific.
10	11 yrs.	5th.	Walked at 3, youngest by 4 years. M., 40 yrs.
11	19 mos.	8th.	Father, 42; mother, 44.
12	6 "	Only.	Father, 28; mother, 20.
13	3 "	Only.	Father, 20; mother, 20.
14	3 yrs.	?	Father, 45; mother, 42.
15	5 "	3d	Has no teeth and cannot stand. M., 40 yrs.
16	7 "	?	Father, 40; mother, 38.
17	5 "	10th.	Youngest by 7 years. Mother, 48.
18	4 "	?	Congenital heart. Mother, 45.
19	2 "	1st.	Father, 30; mother, 24.
20	5 mos.	?	Mother, 40. Specific history.
21	5 yrs.	13th.	Walked at 4 years. Mother, 30.
22	15 mos.	3d	
23	1 yr.	7th.	Youngest by 4 years.

MARASMUS

By Philip F. Barbour, A.M., M.D., of Louisville, Ky.

PROFESSOR DISEASES OF CHILDREN, ETC., HOSPITAL COLLEGE OF MEDICINE.

Marasmus, or inanition, is much more common among the dispensary class than in private work. It occurs occasionally, however, among the children of the better class who have suffered from some prolonged and severe illness. We have all noticed cases where the extreme limit of the child's strength is reached in the effort of overcoming a broncho-pneumonia, or a severe gastro-intestinal derangement. And although it lives through the illness there seems to be left too little strength, too little vitality for it to pass into a convalescence and a return to health, so that it remains, as it were, *in statu quo*. We find that a history of this kind is often present in such cases, or it has been a case of bad feeding or congenital debility or improper hygiene, and in spite of our best endeavors the infant remains at a standstill for weeks or months. The term marasmus is usually limited to wasting for which there is no obvious cause, as, for instance, tuberculosis, syphilis, or acute chronic diseases of the stomach or intestine.

The pathology is not uniform, nor does it always explain the cause of death. The liver is enlarged and fatty, but not more so than in other conditions. All the organs are pale, but there is a tendency toward hypostatic pneumonia. It is probable that the chief lesion will be found in the mucous membrane of the gastro-intestinal tract, for the symptoms point to such a condition.

Rotch calls attention to "Atrophy of the mucous membrane of the bowel." Holt describes the post-mortem findings in the gastro-intestinal tract as follows: "The stomach may be dilated; the mucous membrane is usually pale, often coated with tenacious mucus. The intestines contain undigested food, sometimes mucus. The true pathology of marasmus seems to be a failure of assimilation, owing to imperfect digestion, improper food, unhygienic surroundings or feeble constitution."

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[18] Read before the Louisville Clinical Society, April 28, 1903.

There is no difficulty in recognizing the marasmic or atrophied child, though the cause of marasmus is often very obscure. The child has simply wasted until all the fat has been consumed and the skin hangs in folds, especially upon the inner surface of the thighs. The surface of the body is cool and the temperature, as a rule, runs from one to two degrees below normal. The skin looks brown and muddy and is dry and scurfy. The face is wrinkled and senile-looking. Anemia is marked, as the hemoglobin per cent runs usually under fifty. The poor nutrition of the child makes it an easy prey to intercurrent affections. A simple bronchitis becomes a pneumonia, and any dyspeptic irritation of the bowels produces an exhausting diarrhea. In many of these cases we cannot find anything wrong with the child except that it does not gain in weight. The appetite is good. The stools are apparently normal and show that digestion is not seriously affected. I have seen many children gaining their half pound a week regularly that showed much greater evidences of indigestion and deranged intestines than some of these children exhibit. One fact that goes to show that the fault lies in the assimilation of the food is that frequently no abnormality can be discovered in the stools except that they are abnormally large. The nutritive properties are not exhausted during the passage of the food through the intestinal canal. Predigestion of the milk and the use of the most highly recommended predigested foods seems not to help the baby one whit; they pass in and out and do not seem to tarry long or do much good.

As Rotch says, "Marasmus seems to be due to a vice of absorption." Acting upon this theory I have been trying a new drug in the treatment of this affection. The results have been rather encouraging, so I have taken this opportunity of bringing it before you in order to have it tried more thoroughly. The remedy I have been using is copper arsenite. It is hardly worth your while to go into a discussion of the therapeusis of arsenic, but a brief study of its action will explain some of the reasons for its administration. Arsenic in large doses is decidedly irritating, as has often been observed when applied to the skin. But when it is administered in small doses it exerts a stimulating action upon the cells of the mucous membrane with which it comes in contact. Ordinarily when

Fowler's solution is employed we observe its beneficial influence in an awakening of the patient's appetite and in the increased secretion of the gastric tubules. If too large doses are administered of course the other untoward symptoms which are familiar to us all, will develop. Potassium arsenite being freely soluble is soon carried to the liver, where its mildly stimulating action upon the hepatic cells favors the functions of the liver, as shown by the increased secretion of the bile, the greater amount of the urea formed, the better regulation of the glycogenic function, etc. The further effect of the arsenic upon the general system after leaving the liver is more marked upon the nervous mechanism, but its action upon the cells in the bone marrow in forming new red blood cells should be noted, for anemia is one of the important factors in marasmus. Undoubtedly the improved nutrition of the nervous system is a desideratum and the dryness and scurfiness of the skin are notedly helped by arsenic.

The disadvantage of the potassium and sodium salts of arsenic is their solubility, which favors their osmosis even in the stomach. Of course the antiseptic and stimulating action of arsenic is valuable there, especially as arsenic is one of the very few metallic substances which do not interfere with the peptonization of food.

The more insoluble salt of arsenic is preferable, however, in marasmus, for here we want the local stimulating action of the arsenic upon the cells in the mucous membrane of the stomach and intestines. The happy influence of minute doses of arsenite of copper in controlling nausea and vomiting is made much use of in controlling some of the vomiting attacks in infancy and childhood. It is more satisfactory than drop doses of wine of ipecac. For the pale mucous membrane and the tenacious mucus, the nausea, etc., of marasmic babies, it should be and is helpful. Its effects are, however, not confined to the gastric mucosa. Being much more insoluble than the alkaline salts it passes into the bowel. That which is absorbed is carried to the liver where it is eliminated again in the bile so that the copper arsenite is being absorbed and being secreted in the bile in a happy circle, for its direct action upon the atrophied intestinal mucosa seems to stimulate it to renewed activity and renewed absorption and assimilation.

I have administered it three times a day after feeding in the

3-100th of a grain doses dissolved in water acidulated with hydrochloric acid. My experience with this treatment in some twelve cases has not been sufficiently large to warrant any extended deductions, still one straw or more will be some indication of the trend of the storm. Manifestly when there is any failure of any organ to do its work, we should attempt to supplement its function. And if the food is not undergoing digestion as it should, we should use what means we possess to aid nature. But the administration of hydrochloric acid and pepsin, which naturally occurs to us in the treatment of gastric disorders, does not give us the hoped for results. However deficient the hydrochloric acid and however strong the indication for its use, we find that very few of these children can take it without becoming nauseated. Nausea and loss of appetite are among the greatest evils we have to contend with in these cases. When nausea is very severe lavage and gavage may have to be employed and often they are of benefit. The removal of the tenacious mucus from the wall of the stomach would certainly favor digestion. Nux vomica, or strychnine, is the ideal tonic for such cases, but usually it is not administered in sufficiently large doses. The increase of the reflexes and the action of the bitter principle upon the mucous membrane are both desiderata. Rotch has brought out a very important point in the feeding of marasmic children by demonstrating the relative intolerance of the fats and he modifies the milk so as to keep the fat content very low, until the child shows by gain in weight that the fats can be handled. The proteids are somewhat diminished while the sugar is kept practically at the normal per cent. Thus he advises a milk mixture containing fat 0.5 per cent, sugar 6 per cent, proteids 1 per cent, and lime water 5 per cent.

The administration of cod liver oil would seem from this to be contraindicated, and it has seemed to me that I secure more favorable results from the cod liver oil used externally than when administered internally. Thorough inunctions with hot oils, alcohol, sea-salt baths, massage, etc., have seemed beneficial in some cases, and the mental effect upon the parent is not to be despised.

The prognosis in all such cases should be guarded, for the reserve of vitality is very small and may be exhausted very suddenly. The sword of Damocles hangs over these children. The best indication of improvement is gain in weight. Holt, however, calls attention to a misleading incident in a suddenly occurring edema, the increase in weight being due to the retention of the liquid in the body and not to improved nutrition. Chronic tuberculosis, which is an added reason for a guarded prognosis, cannot always be differentiated from marasmus. It is this inability to determine whether such organic derangements are present or not, that makes the outlook of such cases so bad. In congenital syphilis, for instance, there may be such atrophy of the gastric and intestinal tubules as necessarily would prevent growth beyond a certain point. Tuberculosis of the bowel or other organs may not be accompanied by any elevation of temperature, and so it is only on the post-mortem table that it will be diagnosed. These and other pathologic conditions of the mucosa of the intestinal tract are beyond our help. The fact that we cannot diagnose them does not negative their existence. Therefore one must not be too hopeful of good results in treatment. The improvement following the use of copper arsenite has, however, many times surprised me in the treatment of gastro-intestinal disorders, and it has come to my rescue in some cases of marasmus where I had despaired of affording any relief.

DISCUSSION

Dr. M. K. Allen: It is alarming to note the number of death reports that are coming in to the Health Office from marasmus in children. About one-third of the deaths occurring in this city are of children under the age of five years. That does not say very much for the medical profession in Dr. Barbour's line. I have had no experience with the drug he recommends, but the death certificates, especially those which come from institutions, are generally signed "inanition," which seems to cover a multitude of diseases. To my mind the cause of inanition is improper feeding. To determine what should be fed is a serious question; just what will be digested and assimilated and nourish the body and maintain the vital forces and the resisting power to other diseases which are the real causes of death is a question for just such men as Dr. Barbour in his special line of work. I believe that with the milk supply that we now have, we will have fewer death certificates signed inanition. A great many babies fed on artificial foods die of inanition, and the babies of Louisville are being supplied with a better class of milk than they were formerly. I cannot say very much more, because I had all my data ready to speak on whooping-cough.

Dr. W. Ed. Grant: I think I will say in defence of Dr. Barbour and his associates that he is engaged in the training of very delicate plants to grow. A medical student was talking to me the other day about "chopping cotton," and I asked him what he meant by that. He told me that they sow the cotton seed continuously in a row and when the plants get a certain age they go through with a hoe and "chop" out all but the hardiest plants, which are left to grow. The more I see of human life the more I am impressed with the fact that it is a good deal like plant life and growth. These little babies make strong human beings if they are reared with the proper care, but they have many things to contend with and it is difficult to get them started.

I do not believe much in medicine in the treatment of marasmus, but I do know that proper food, good care, proper nursing, sunshine and fresh air do restore many that we think are going to die. I do not give up these cases, for I am always reminded of a suggestion made by a friend of mine, a distinguished physician, Dr. Palmer. We had one of these cases that we were both distressed about. I was attending to the child at the time, and I said to him, "Doctor, I feel discouraged about that baby, and it looks like we are going to lose it." He replied, "I will tell you what that baby should have." I got out my note-book and pencil to take it down, and he said: "Go tell them to get all the t-i-m-e they can at the drug store and give it to the baby." Time, care in nursing, sunlight, and fresh air I have found very useful. Do not give them up. The institutions are at a disadvantage because they have to feed them on prepared foods and unsuitable milk, and right here I want to congratulate Dr. Allen on the steps he is taking in bringing to the houses of our people proper food and getting the other kind out of the market where it can be sold to ignorant people.

I remember some time ago, while visiting Seville, Spain, the guide offered to take me to a foundling institution. I was very glad of the opportunity and went to see the children, who were of all ages from infants up to good stout boys. I found that they had no difficulty at all in growing these babies, and the secret of this was that they had no difficulty in getting wet nurses. They had plenty of room and fresh air and good nurses to take care of them, often their own mothers. The opportunity of getting good wet nurses is greater in Spain than it is here. They do not have to be sought, but come voluntarily. They are paid a small sum and as I said are in many cases the mothers of infants left there. They have an arrangement by which infants may be put in through a window and the weight of the child rings a bell and a nurse come and takes the child away. The mother may present herself the next morning as a wet nurse. All of them are fed by wet nurses, and most of them are saved.

I was quite interested in the paper and glad to have heard it and the discussion. I believe the complexion of a tuberculous child helps me in making the diagnosis; its complexion is clearer than that of the marasmic child, which is usually muddy. In a few cases there is fever to help us out.

Dr. Morris: I have very little to say, as I am new to you all. But the subject of marasmus is so important and one with which we all come in contact, that all of us might say something. As to the treatment, I fully agree with the gentleman who has just spoken, that it is very limited. There is one thing that occurs to me as of greater importance than any other one thing, and that is the teaching of the mother or the nurse as to what should be done for children. We cannot raise the children for them, and we should as a profession instruct them in these duties. There should be some public way without expense to mothers where they could be instructed. I believe that more can be done for these children by the physicians in that way than by any form of treatment. If we can get them reared right, with proper surroundings, there would be much less of this trouble. Until that line is adopted and some means of instruction provided for those who have the care of children, I believe that we will not make much improvement along these lines.

Dr. T. P. Satterthwaite: Many years ago, in connection with two other doctors, I conducted the old University Clinic, which was then the general depot for procuring wet nurses. I have been instrumental in connection with the University in raising many of the ladies of this city. Old Dr. Miller and Dr. Louis Rogers and others were associated with me. There was hardly a week that some lady did not write a note, asking us to send her a wet nurse.

We all recognize that there is no substitute for breast milk, but now it is very seldom that ladies will resort to the employment of a wet nurse. Why this is, I do not know. I have often begged them to do so. For those who are able, there is nothing that will compare with the benefit of a change of climate. I have seen it in my own family. Before I have gone a hundred miles from Louisville on the steam cars, I have seen a change in my babies. But of course the majority of children belong to the class that cannot resort to that measure.

I do not have much faith in medication. Out-of-doors as much as possible, and my plan is cow's milk, diluted with barley water. These are the best remedies I have been able to employ. Inunctions of oil are good, but keep the little one as much as possible out of doors.

Dr. J. A. Flexner: I have been very highly entertained by the paper and by the discussion. I was very much interested in Dr. Barbour's pathology of this condition and think he is right in putting the cause of marasmus in the food. It occurs to me that we see more cases of marasmus in children who are fed on sterilized foods than in those who are fed with modified milk without sterilization. It seems to me that as between the trouble following the employment of a wet nurse and the selection of a properly modified milk formula, there is scarcely a family in the city that cannot use the modified milk and dispense with the disagreeable features of the wet nurse. These proprietary infant foods are also bad. I have in mind the case of a child which was taking a bottle of Mellin's food a day. It was the most perfect picture of a human mummy I ever saw. The father was a cigar-maker earning $7.50 a week, and he had three other children, and the expense of feeding was an important item. It had to be a simple food and easily prepared. I sent across to the grocery and got plain grocery milk and fed it a drachm at a time. This was increased until it was taking a pint or two every twenty-four hours and this was a great saving in expense to the man. The question of unsterilized food, of which the basis is modified milk, is the keystone of the arch.

Dr. Ewing Marshall: I have enjoyed the paper and the remarks of the gentlemen and would add my voice to the out-door treatment. We can understand that the children of the poor in unsanitary surroundings live in a vitiated atmosphere of necessity. These conditions are villainous, but we also find many well-to-do people raising their children in a vitiated atmosphere, keeping them in over-heated rooms.

Dr. J. W. Irwin: I had not thought of anything but whooping-cough for twenty-four hours, and now Dr. Barbour has switched us off to keep us from discussing his paper. I have found the paper and the discussions very interesting. But I have noticed that very few of the speakers claim to have cured this disease. Our essayist himself did not claim any cures. If we regard all the cases of disorders of nutrition as marasmus, then of course many cases will be cured. If we regard the conditions where there are pathological lesions in the stomach and intestines and glands non-tubercular as marasmus, then we will have cures in many cases. But in the cases of catarrhal disorders due to improper feeding, the correction of the errors is the first step toward a cure. If we are going to treat marasmus where we cannot point out the cause except that it has had improper food thrust into its stomach, we must look beyond and find that there is not a single cure. Your fresh air, sunlight and sterilized foods of all kinds will do no good, for they have paresis of the nerves of nutrition, and there is no possibility of restoring them back to health.

But if you regard disorders of the stomach and intestines due to improper feeding at a tender age as marasmus, then correct the errors. It is not necessary to enter into any special treatment. Only correct the errors and then give them your fresh air, sunlight, baths, inunctions and so on. They will occasionally get well but nature cannot always react and many of them will fall victims to the disorder. They do not die of marasmus, but of malnutrition. Marasmus covers a multitude of sins and many of the death certificates so signed should be signed malnutrition. If we come to the question of marasmus and study it closely, we find a condition where the functions of the body fail to respond and decline comes on without any lesion to be observed; these are the cases we should consider as marasmus and these are all incurable.

Dr. H. N. Leavell: I think that Dr. Barbour made a very wise change from pertussis to marasmus at this season of the year. This subject is intimately associated with infant feeding and it is hard to separate them. I believe that most cases of marasmus begin, in the early stage, in improper feeding, and I do not believe that a child born with a healthy organism will have any other kind if properly cared for, barring tuberculosis. I believe the treatment of marasmus is more prophylactic than curative. It is not possible to cure every case of marasmus with any drug, but we must look to the diet and the surroundings. Dr. Barbour has shown that most of these cases are found in dispensary practice, in families with bad surroundings, and we must modify all that. The rule I have observed in the care of infants is to have the mother weigh the child once a week until it has attained the age of nine or ten months or even more. I believe if we do that we will be better able to guard against any interference with nutrition. We will be surprised sometimes to find that they do not gain in weight although there is no evidence of malnutrition. A half pound loss a week may not mean much, unless it persists for several weeks. We will very often find that the cause is overfeeding at night. I believe most of the marasmus is caused by a lack of rest at night. They should not be fed more than twice under three months, or above three times under five months. We should adopt some rule and give their digestive organs some rest. If we will make it a rule to weigh these babies we will have fewer cases of marasmus.

I have never used the arsenite of copper except in diarrhea, and it has yielded excellent results there. I shall certainly give it a very faithful trial, along with dietetics and out-door measures.

Dr. M. F. Coomes: I have served a thorough apprenticeship in the signing of these death certificates of children while I was at St. Vincent's Orphan Asylum. They just died there without hesitation, and without even apparently giving me a chance to save them. I do not know that I ever saved one. They just died, and died, and died. I gave up the idea of medicine and relied almost entirely upon proper feeding and management of the children. This is about all that can be said on the subject. I believe the most worthless of all these drugs is pepsin. If I had a thousand cases and thought I needed pepsin, I would give diastase. Cod liver oil is the only drug I have ever used with benefit, and in the last few years, with the exception of quinine, I give no drugs to these children except cod liver oil locally, which is better than internally. I have never tried arsenite of copper.

Dr. G. B. Young: Upon the subject of marasmus I have nothing to say, but since the subject has taken a wider range I may say a word. I have used the arsenite of copper for about twelve years, and I suppose I antedate a great many people in that respect. For digestive disturbances, not always intestinal, I have found it so beneficial that I never go away with my children without a bottle of these tablets with me. I do not know of anything that seems to do as well. I give it in even smaller doses than Dr. Barbour. My custom is to take a hundredth of a grain tablet and put it in two ounces of water and give a half drachm every two or three hours.

The next point is the question of feeding, which I think is one of the most important. As Dr. Leavell said, so many of these children are fed too much. I have seen in a number of instances children who were not thriving at all make almost miraculous improvement in from twenty-four to thirty-six hours after I had hammered it into the head of the mother that they should be fed by the clock and not by their appetites. The organism of the child breaks down in the attempt to dispose of all the material that is often poured into its stomach. I remember a number of years ago I used to go up to Randall's Island, and the death rate there was something like 97 per cent. The first time I went into the mortuary there were eight or ten of these little bodies, some on the tables, another in the corner, another under the table and others scattered all around the room. I understand that now, after failing to do much with sterilized foods, they have changed the character of the nurses and of the food, giving modified milk scientifically prepared, until the death rate is within reasonable limits.

As to the wet nurse question, there is no use approaching it in the United States, because the people simply will not have it. The fully intelligent mother who will devote the attenion to her baby that others do to things of far less importance, with a good milk, a good formula and no sterilization, will have far less trouble than any other. I had some experience with wet nurses in Italy, where the custom of employing them is universal. The poorer class nurse the children, as the well-to-do class are opposed to doing so. The arrangement is made at the time of labor, and women are selected through agencies for that purpose, and the wet nurse is the queen of the whole situation. I remember one who arrived with two large chests of drawers, and she said they were for the purpose of carrying her presents home when she was through nursing. They have everything they want, and no one will raise a finger for fear of spoiling the milk. She generally supports her husband and perhaps other relatives about the place, and when she goes home the family feel disgraced if they do not load her with all kinds of favors and money. My own feeling is that if they cannot be nursed naturally, I would get a good formula and feed them by the clock.

Dr. Carl Weidner: I think we have had one of the most interesting papers and the best discussion we have had for a long time. I believe Dr. Allen's attack upon the pediatricians is unfounded. They have generally improved under new conditions, and I remember the mortality in the older text-books was much higher. Dr. Young's statement with regard to Randall's Island shows this improvement. In that hospital it was formerly 97 per cent, and now it has been greatly reduced.

Dr. Grant's comparison of children to the plants is in line with the theory of the survival of the fittest. That is true of animal life as well as vegetable life. Some children are born with delicate constitutions, and many of them die, and marasmus is the term simply to cover our ignorance of the cause. I believe that the main thing is intelligent observation on the part of doctor and training of the mothers, and with our improved knowledge the time may come when conditions will be better. I think that the preventive form of treatment is the most necessary of all.

As to food, I will simply put myself on record that I believe the unsterilized milk is preferable. Sterilized milk is unpalatable and it does not agree so well with the child. There lies the greatest duty to health, and Dr. Allen has made and is making all attempts to improve the condition of things. Then the next point is to keep the milk in as good condition as possible, and the mothers should be instructed. It should be furnished in a great deal better way than at present. I believe that ice-carts would pay, and the milk might be kept on ice. The family ice-box has done a great deal to protect the lives of children. With these precautions we can lessen the mortality. When Dr. Irwin puts stress on the nervous system, I think that is secondary to the digestive system after all. I think improper feeding is at the bottom of it.

Dr. Philip F. Barbour: I think it was a good thing that I changed the subject; if I had presented the paper on whooping-cough we would have needed two meetings to discuss it. I have been very much interested in the discussion; all of the points have been of interest. I think all pediatricians owe a debt of gratitude to Dr. Allen for his work for better milk. I only wish him God-speed.

The general consensus of opinion seems to be that medicine does not do much good. That is my experience, and I have presented this paper before you only to introduce arsenite of copper as the drug which I have used more successfully than any other. I give one three hundredth of a grain three times a day, regardless of age. We have all run the gamut of digestives, prepared foods, etc. Arsenite of copper has given me results in about twelve cases of marasmus that were surprising. Whether it was a coincidence or not, I do not know. I only wanted to bring it before you and let you try it.

Dr. Grant spoke about the complexion in tuberculous cases. Ordinary cases of tuberculosis have fair complexions, but in abdominal types you will find that they are muddy.

Dr. Morris spoke about instruction of the mothers in feeding. I wish the doctors knew more about it and that I knew more about it myself. We do not know today what are the constituents of milk. You take a cow fed on hay and slops and put it out on the meadow and the milk will not agree with the child. Why is this? We do not know.

I do believe a good wet nurse is better than a good cow, but most of them want the earth, and they become perfect nuisances. I am not surprised that they gave them two chiffoniers of things in Italy to get them to leave the house.

I did not advise that arsenite of copper be used without any of those other valuable medicaments, sunshine, fresh air, etc. It is the drug in addition to the others that I recommend. They are all good, but they do not cure marasmus. Dr. Irwin says there is no pathology for marasmus. If you find a pathological condition in the intestine to explain it, it is no longer marasmus. You cannot find any lesion at the postmortem to explain it. My personal opinion is that the trouble is in the absorption of the food.

Prophylaxis is an excellent idea if we only knew when to begin it. Cod liver oil is one of the best things externally. Sometimes when we see these little dried up fellows we feel that if we could just soak them in oil it would do them good. They cannot digest it internally. I always have it rubbed in as hot as the nurse can bear her hands in it. I think cod liver oil is the best of the oils.

Dr. Young speaks of the dose. His dose is the one I ordinarily employ when I give it for nausea, but in marasmus you have to give a dose which the people will not have to repeat every few minutes. I give it four or five times a day.

As to the mortality of infancy, I will say for the pediatricians that it has been greatly cut down in recent years. Recently an asylum in Italy had a report of 99 per cent mortality, and a great howl went up all over this country.

One final word. Children in foundling institutions are children of poor parents, frequently illegitimate, and have to contend with an inherited debility. No nurse will take care of a child like its own mother.

As to the Pasteurized milk, it is my preference for milk in this city. If you can get a cow in perfect health that is better. Otherwise, the pasteurization of milk, raising it to the temperature of say 160° F., does all that is necessary.

POTT'S DISEASE OF THE SPINE IN CHILDREN: ITS COMPLICATIONS

By James H. Tebbetts, M.D., of Hollister, California.

The principal and most important complication of Pott's disease is the tuberculous abscess, and will demand all our skill and attention. It is also the most frequent complication that may occur, although we may safely remark that, with thoroughly efficient and early treatment of the original disease, we would surely find fewer abscesses. We may add, however, that it is not an infallible evidence of incomplete or improper treatment, and one cannot always prevent the formation of an abscess. It is in fact quite remarkable that it does not occur more frequently, and produce more serious results.

When this condition occurs, we do not have the true abscess formation, as it contains no pus, primarily, and it is better to describe it under the name of "tuberculous abscess," containing tuberculous fluid, and, in addition, serum leukocytes, casein, and fibrin, more or less cheesy necrotic tissue, with frequently microscopic bone tissue, forming a sediment on standing. This fluid is sterile, unless secondary infection has occurred, when pus is then present, green or yellow, and of uniform consistency.

The abscess may be produced by certain conditions, which cannot always be determined in every case. We notice, first, the lessened power of resistance of the patient to the tuberculous invasion. This may be both general and local. There may be a history of a previous injury received. Pyogenic infection is not required to produce the abscess, and, as above stated, many of them are sterile, or contain tubercle bacilli only. Pressure and irritation are potent factors, both in producing an abscess and increasing its size.

An abscess may escape observation during the patient's lifetime, and then be discovered at the autopsy. They are present in over 25 per cent of all cases of Pott's disease, in about 8 per cent of the cervical cases, 20 per cent of the dorsal, 72 per cent of the lumbar, and at least 50 per cent where the disease is in the lower spine. Here the vertebral bodies are larger, and offer less resistance than do those of the higher spine to the progress of the disease.

The table of Treves shows the origin, location and point of appearance of these spinal tuberculous abscesses:

Variety.	*Course.*	*Exit.*
Cervical . .	(a) Anterior	Into the posterior wall of the pharynx.
	(b) Burrow beneath the deep fascia, into the thorax, as a mediastinal abscess.	Into the trachea, œsophagus, or through an intercostal space.
	(c) Laterally, between longus colli and scaleni muscles	Posteriorly, to the sterno-mastoid.
Dorsal . .	(a) Burrow posteriorly.	On the back or side, a short distance from the spine.
	(b) Within the psoas sheath.	Beneath Poupart's ligament, in Scarpa's triangle.
Lumbar . .	(a) Enter psoas sheath.	As psoas abscess.
	(b) Burrow between the fasciæ of the quadratus lumborum and abdominal muscles, through the internal oblique.	Posteriorly beneath the external oblique, and latissimus dorsi, at the outer border of the erector spinæ muscle.
	(c) Gravitate beneath the internal iliac muscles over the posterior brim of the pelvis, perforating the great sciatic foramen.	As a gluteal abscess.
	(d) May be directed to the iliac region, along the aorta, and external iliac arteries.	As a gluteal abscess.

The abscess may remain stationary for a considerable time after its discovery, and should there be a rapid and notable increase in its size, we may expect that some outside infection has been received, or that rapid destructive changes are occurring. The position and size of an abscess may produce pain and discomfort, and attract in this way the attention of the patient. Pain and temperature also indicate that the abscess is nearing the surface, and always in the line of least resistance, aided by both gravity and pressure. The course of an abscess below the diaphragm is very interesting. It may enter the sheath of the psoas muscle, appearing externally upon the inner thigh as a psoas abscess. It may enter the sheath of the quadratus lumborum and appear between the twelfth rib and the crest of the ilium as a lumbar abscess. It is called an iliac abscess when it passes downward upon the iliac fascia, sometimes appearing at the outer end of Poupart's ligament. When it passes through the greater sciatic foramen, a gluteal abscess results.

They may develop unilaterally or bilaterally, may appear in the mouth, thorax, in the posterior mediastinum, or passing downward therefrom, through the aortic opening in the diaphragm, form an iliac abscess. A retropharyngeal abscess may be caused by tuberculous disease in the ocipito-axoid region, the fluid passing between the recti muscles. It may also dissect a path around the skull, or even enter the foramen magnum.

From the middle cervical region an abscess may dissect a channel between the scaleni and the longus colli, thence between the trapezius and the sternomastoid, reaching the surface at the anterior border of the latter. In rare instances an abscess has entered the spinal canal, pleural cavity, lungs and intestines. The psoas abscess is undoubtedly of most frequent occurrence, and is seldom seen in children, except in Pott's disease, and is nearly an infallible sign of dorsal or lumbar tuberculous vertebral disease. They may open into the hip joint, giving rise to hip joint disease, or into the inguinal canal, simulating hernia.

Leukocytosis is found in some cases of abscess, although not invariably. Fever is not a constant symptom, but where a patient has had considerable fever it often proves a forerunner of an abscess, which, however, may not reach the surface for several weeks or even months. Hectic fever, together with other septic symptoms, is not usually present unless the abscess cavity has opened and infection occurred, but slight temperature is often observed without such infection.

An abscess in the lung produces less disturbance than one would expect, and the only physical signs found may be those of a chronic or acute localized pneumonia. The abscess may rupture into a bronchus and the fluid be coughed up, followed by more or less collapse, according to the size of the abscess.

A sudden discharge of pus is indicative of the rupture of an abscess into the pharynx, esophagus, intestine, or bladder. It is not unusual for an abscess to become stationary and absorption of its contents to follow.

An abscess is of serious import to the patient by causing delay in our mechanical treatment. Deformity is often increased by the abscess formation, and death may occur from asthenia and secondary surface infection. Spontaneous openings may discharge for years, unless very thoroughly treated, and with good drainage, and even then sinuses, deep and tortuous, may remain unhealed. The rupture of abscess fluid into the peritoneal cavity is usually fatal, and invariably so in case it should in its course communicate with a large blood vessel. As soon as recognized, the abscess fluid should be evacuated, followed by the most free and careful drainage, under perfect aseptic surroundings and precautions.

The retropharyngeal abscess may be opened from the mouth, if time is urgent, but it is better surgery to operate by external incision along the posterior border of the sternomastoid, in its upper third, dissecting carefully; then open and drain thoroughly, and the opportunity for this free drainage gives this method its advantage.

An abscess of the thorax should be treated by rib resection and drainage. In those of the lower spine, treat by free incision, gently remove all possible of the abscess membrane with a small gauze sponge and pressure, flush well with salt solution and secure free drainage, with counter openings, if required. The patient should live in the open air and sunshine, and receive most careful mechanical treatment, as indicated.

It is possible in some cases to aspirate these abscesses, repeating as often as the cavity refills, and following with a pressure compress. Where the abscess is still uninfected, there is good authority for the treatment by injection of sterilized emulsion of iodoform and glycerin, in 10 to 20 per cent, using 2 to 4 drams once in one to two weeks, either with or without previous evacuation of the contents. The toleration of the patient for iodoform should be watched, and with this in mind, and with aseptic precautions, no harm has resulted. Iodoform has no value where the abscess cavity has become infected, nor does it have much effect upon the general tuberculous process. A favorable result may be expected where the abscess contents are transformed into a viscid fluid, and from one to six injections are usually sufficient to produce this effect in susceptible cases.

While not so frequently occurring as abscess, as a complication in Pott's disease, paralysis is seen in from 5½ to 13.7 per cent of all cases, according to different observers. It is not as serious a complication, however, and, like abscess, may and does occur in some cases where early and approved methods of treatment are employed. The principal cause of paralysis is pressure, from some source, somewhere upon the cord or nerves. There may be swelling, and hypertrophy of the softer tissues within the bony canal, thickening of the dura, and pachymeningitis resulting from extension of the tuberculous process backward through the posterior ligaments, and invasion of the epidural space. There may be pressure from a necrosed fragment, or from a neighboring abscess.

Paralysis develops more often in cases where kyphosis is moderate or slight, and where the disease is located in the upper and middle dorsal region, as here the spinal canal is smaller, and it is more difficult to secure and maintain proper and efficient fixation treatment. It is said that 15 per cent of all these cases may show more or less paralysis symptoms during the progress of cure. An early symptom of paralysis is an attack of herpes zoster along the course of the nerve first sustaining pressure. Paralysis has been observed before the deformity was apparent, but it usually develops from six months to one and one-half years after the tuberculous process has begun.

The shambling gait and manner in which the patient will drag his leg will usually first attract attention, and there will also be noticed undue muscular fatigue and weariness on slight exertion, and there soon appears the inability to stand erect. The exaggerated reflexes are shown upon examination of patellar and ankle, and still later on, muscular rigidity develops. Motor paralysis precedes the sensory, and sensation may remain after loss of motion, as the anterolateral columns receive the most pressure, but if the case continues to progress unfavorably, there will be more or less sensory paralysis.

It is very necessary to distinguish true paralysis from cases that may simulate this condition, in those patients who are simply bedridden, but are not paralyzed, and whose reflexes are normal. They may be asthenic, or have contraction of the psoas muscle and may be discouraged and believe that they cannot walk. Both legs of a patient may become equally affected at the same time, or one may precede, and the same may be noticed in convalescence.

In the early stage, where weakness is about the only symptom, spastic rigidity of the limbs may be produced by moving them, or by stimulating the reflexes. Sensation, in the mild cases, although not entirely lost, is nevertheless impaired, and so, also, is control of the bladder, while that of the sphincter ani is but slightly affected. Pain is rare in paralysis, and, if present, is but the usual characteristic pain of the disease. The extent of the paralysis naturally depends greatly upon the location of the cord pressure.

In convalescence the first favorable indication is lessening of the rigidity, with slight return of motion to the toes and feet, with more or less rapid improvement thereafter. The exaggerated reflexes may persist for quite a long period after recovery, and many patients show them who were not paralyzed.

Prognosis is, on the whole, fairly good in these cases of paralysis, and recovery may safely be anticipated in 70 per cent, and may occur early if proper treatment has been instituted. It is usually complete without subsequent traces. The prognosis depends greatly, of course, upon the extent and amount of cord pressure, as shown by the degree of paralysis, and recovery will be slower and more doubtful in those cases where the sphincters are much involved, but may eventually occur even in the worst and apparently most hopeless cases.

There may be a recurrence of the symptoms after an apparent recovery, and this has been reported from one to seven times. These relapses may be possible where treatment has been either neglected altogether, or immobilization of the spine has been too brief.

The treatment of paralysis is mechanical, and thoroughly efficient treatment of the disease in general fixation of the spine as perfectly as possible. This needs particular emphasis, as there is sometimes an effort made to have the physician relax the immobilization treatment at this very time when greatest care and vigilance are imperatively indicated. During convalescence, massage and manipulation of the limbs should be faithfully employed, but these methods are contraindicated in the early period, being then liable to overstimulate the nerve centers.

Iodide of potassium may be administered in small doses, gradually increasing to a considerable dosage, then slowly decreasing to the original amount. The operation of laminectomy is not now recommended except in rare and selected cases, and is seldom indicated.

FOREIGN BODIES IN THE INTESTINES

By L. T. Royster, M.D.,

attending pediatrist to st. vincent's hospital, norfolk, va.

Seeing the recent report by Dr. Holt of a case of foreign bodies in the intestines, I feel justified in reporting the following:

About eleven o'clock in the morning I was called to see a child, an inmate of an institution. On my arrival I found patient in a convulsion and was told he had had one before my arrival. I controlled the seizure with chloroform and ordered a bowel irrigation and later a dose of oil. In about an hour after this the nurse reported that she had given the irrigation and had removed from the bowel several lumps of coal as large as the end of the little finger.

About five o'clock in the afternoon I was called again and found the child as before in convulsions. I again administered chloroform, which controlled the spasm temporarily but discontinuing the administration the child continued to be convulsed. This condition grew steadily worse and in spite of my efforts the child died in about an hour.

Autopsy showed the ileum and colon to contain a large number and great variety of foreign bodies, varying from buttons and safety pins to coal and splinters of wood, some an inch long; one of them was sticking in the gut crosswise. I did not keep an account of the total number of articles, but there were certainly twenty-five or thirty.

SOCIETY PROCEEDINGS

AMERICAN PEDIATRIC SOCIETY

Fifteenth Annual Meeting, held at Washington, D. C.,

May 12 to 14, 1903.

FIRST DAY—MAY 12.

PRESIDENT'S ADDRESS.—Dr. J. P. Crozer-Griffith, of Philadelphia, thanked the society for the honor tendered to him, and said that he had chosen to present some facts which would, he hoped, be interesting to the society bearing on the work in pediatrics during the past year. He said that while the knowledge of work well done was in itself gratifying to the physicians, any work that had been done to improve the art of infant therapy was more far-reaching. This society, he said, had done much to advance the science of pediatrics. Three hundred and ninety-two articles had been presented to the society since its birth, fifteen years previously, and many of these had attracted international attention. The work, individual and collective, on diphtheria, infantile scurvy and disorders of the digestive tract had been of especial value. One thousand five hundred and thirty-five articles had been contributed to medical literature during the past fifteen years by members of the society, thirty text-books had been written, and several members had contributed sections to the composite works. Two journals of pediatrics had been established, and both were in flourishing condition. Dr. Griffith urged the members to overcome the present trend to become too practical, and not to allow mere money making to interfere with scientific research, both for the maintenance of the reputation of the society and for the advancement of pediatrics.

SYNOPSIS ON SOME OF THE RENAL LESIONS IN INFANCY.—Dr. C. F. Martin and Dr. F. M. Fry, of Montreal, based their paper on a study of a hundred cases of nephritis in infants under three years of age. Sixty-five were fed on modified milk and thirty-five were breast-fed. The maximum specific gravity of urine was 1.028, the lowest was 1.001, an average being 1.006. In nineteen ascites was present, in all cases albumin was present in variable quantities, in only ten was albumin present without casts. In twenty-six cases there was an excess of uric acid.

NEPHRITIS IN A FOUR-YEAR-OLD BOY HAVING ONLY ONE

Kidney.—Dr. A. C. Cotton, of Chicago, presented the history of a child who had been a healthy baby. When three years old he had measles, and six months later pneumonia. After the pneumonia there was some edema of the ankles and around the eyes, and he had frequent scanty high-colored urination. Hot packs were employed, diuretics and saline injections per rectum were used, but the child grew worse, with a few periods of apparent improvement, and finally died with the fully developed picture of uremic-intoxication. During the progress of the disease the urine showed a progressive diminution in the urea excreted, and in the amount of solids. The presence of albumin was constant, and hyaline, granular and some waxy casts had been found. On autopsy the pleural, pericardial and peritoneal cavities were found to contain clear serous fluid. The right kidney weighed sixty-five grams, the capsule was not adherent; the cortex was pale and the markings were indistinct. The left kidney was replaced by a triangular body about one centimeter in length from apex to base. An artery and vein were traced from this body to the aorta. The right ureter was normal, the left terminated in this rudimentary kidney and contained no distinct lumen.

Edebohls' Operation.—Dr. T. M. Rotch, of Boston, reported a case of a nine-year-old boy with a severe nephritis. He never had had scarlatina. Renal decapsulation was employed and the child died two weeks later. Dr. Rotch spoke of the fact that renal disease was at present so little understood, and that there was as yet no appropriate nomenclature correlating the clinical picture with the varying pathological conditions. The marked beneficial results that had been attributed to Edebohls' operation had attracted much attention, but many of these patients might have had functional disease and in whom recovery would have taken place had no operation been resorted to.

Dr. G. M. Edebohls, of New York, in discussion, said that at present he had nothing to add to the statements made in an article in the *Medical News* of a year past. He said definite results could not be pronounced under four or five years.

Dr. B. K. Rachford, of Cincinnati, thought that most cases of nephritis in children were due to an acute infection of some kind and tended to complete recovery, while in adults the tendency of the process was to become chronic. For this reason the value of the operation should be determined by results obtained in adults rather than in children. It was impossible to determine the value of operative measures in cases of less than six months' standing, for the ultimate conditions might have been the same or perhaps more favorable without operative interference.

Dr. Rotch said that chronic nephritis did exist in children, and occasionally resulted fatally. Nephritis of adults and that of children were two distinct conditions, and each should be studied separately in order that it may be discovered which cases are favorable and which unfavorable for operation.

Dr. C. G. Jennings, of Detroit, reported a case of chronic renal disease in a child in whom there was severe persistent pain over the left kidney. The chemical and microscopical examination led to the diagnosis of chronic interstitial nephritis. Operation was resorted to, but the exposed kidney showed no microscopic pathological conditions. Renal decapsulation was done, and it resulted in complete recovery in two months.

CLUBFOOT OPERATED ON BY PROF. LORENZ.—Dr. S. S. Adams, of Washington, D. C., showed this patient, who had been subjected previously to five tenotomy operations with little benefit. The deformity was extreme, the child standing on the outer side of the little toes. Prof. Lorenz corrected the deformity, relying entirely on hand pressure, devoting twenty minutes to each foot. The feet were encased in plaster casts for three months. The child was able to walk in them with comfort; the casts, which were removed to allow examination of the feet, were to be reapplied for several months longer.

ABSCESS OF THE LUNG.—Dr. Adams described the physical signs in the chest of a two-year-old child. There was evidence of fluid in the left lower chest, and of incomplete consolidations in the left upper chest. The child had an irregular febrile temperature. By means of the aspirating needle about a dram of pus and bloody serum was obtained from the left upper chest, and a diagnosis of empyema was made, but no pus was found in the pleural sac at operation. On autopsy an abscess was found in the left upper lobe. The abscess was due to a streptococcus infection. The right lung was normal, and no other abscesses were found in the body.

SECOND DAY—MAY 13.

GASTRO-ENTERIC INFECTIONS OF NEW-BORN CHILDREN.—Dr. Irving M. Snow, of Buffalo, said that the first four weeks of existence were the most dangerous to human life. A few years ago it was taught that 80 per cent of early deaths could be attributed to congenital debility. At the present time it is known that atelectasis, intracranial hemorrhage and sepsis are among the more important causes of infantile mortality. There are many ways by which the new-born child might be infected, but the alimentary tract as a site of infection had not been sufficiently considered. Bacteria are introduced in various ways, by the finger of the accoucheur or nurse, by the breast, in the milk, and at times the amniotic fluid is responsible for the infection. In a young child the infection may soon become general, whatever the path of entrance might have been. Vomiting, diarrhea and colic, along with other signs, might be due to dyspepsia, but a severe gastro-enteritis meant an infection. The dividing line between dyspepsia and gastro-enteric sepsis, as manifested by the physical signs, was variable, depending upon the virulence of the infection. Dr. Snow detailed the histories of five cases which he considered to have had severe gastro-enteric infections. The cases were characterized by fever, rapid pulse, irregular respiration, vomiting, diarrhea and great prostration. The stools contained blood and mucus and were very offensive, in some cases tonic spasms were present. The prophylactic treatment consists in rigorous asepsis and careful attention to the toilet of the mouth. A case that had developed should be closely watched, as sudden alarming symptoms were common; strychnine, atropine and artificial serum were valuable therapeutic adjuncts.

THE BACILLUS OF SHIGA AND SUMMER DIARRHEAS.—Dr. Simon Flexner, of Philadelphia, who was invited to speak to the society on this subject, said that there had been no lack of effort to ascertain the etiology of diarrheal diseases, but that little definite information had been obtained as to the cause of infantile diarrheas previous to recent investigations. Booker's work in Baltimore stood almost alone. While on an expedition to the Philippines, Dr. Flexner had devoted much time to the study of dysentery and had no difficulty in establishing the existence in these cases of a well-defined micro-organism that differed from the ordinary intestinal bacteria, and which resembled the bacillus of Shiga. The bacilli were identified by means of Widal's agglutination test. This organism resembles the typhoid bacillus, but certain definite characteristics render a ready differentiation possible. Since Shiga described this organism it had come to be recognized as a cause of a definite group of acute cases of dysentery in adults. Dr. Flexner thought that the same methods of studying the diarrheas of infants might yield results of value. Fifty-two cases of severe summer diarrheas were studied at the Wilson Sanitarium, near Baltimore. In forty-five cases the bacillus of Shiga was present. The blood serum of these children gave a positive reaction with the organisms obtained from their own dejecta, with the organisms obtained from the dejecta of other children and also with organisms obtained from Japan and the Philippines. In these cases blood and mucus were present in the stools. It was not easy to find the bacteria in formed feces, it was much easier when mucus was present and still more so when both blood and mucus were present. Dr. Flexner called particular attention to a few points of practical importance. It was desirable, he said, for those who attempted to obtain the bacteria from stools of suspected cases to first study the bacilli of Shiga, since ordinary cultures closely resembled those of the typhoid and colon bacteria. It was suggested that all colonies that developed in the first twenty-four hours of incubation be marked with a blue pencil, these would be mostly colon bacilli. The colonies are grown for a second twenty-four hours and the newly-developed colonies should be transplanted, and in the second crop the bacillus of Shiga was most likely to be found. The culture medium should be glucose-agar. Colon bacilli decompose the glucose with the formation of gas, the bacilli of dysentery do not, this fact allowed of a second means of colony differentiation. Careful study has revealed the fact that the bacteria of dysentery are not of a single type. A group of Shiga's bacilli is now recognized that had marked agglutinating properties, but that did not change litmus when cultivated on a mannite medium. A second group is also recognized that had all the cultural properties of the first, but differs in its agglutinating properties and gives an acid reaction to litmus when grown on a mannite culture medium. At present it is impossible to say that one or the other type is the cause of dysentery; in some epidemics one type is found, in others another type, in some cases both are found. All of the cultures obtained from the children produce an acid reaction when grown on a mannite medium and are not the original bacilli described by Shiga. The position which these organisms shall occupy as etiological factors in diarrhea must be determined by future investigators.

In discussion, Dr. W. H. Park, of New York, spoke of the difficulties of the agglutination test, and added that when the dysentery bacilli were present he expected to find blood and mucus in the stools.

Dr. Henry Koplik thought that summer diarrhea was a very complex condition. He said that the great majority of cases occurred in artificially fed infants, and are caused by anatomical or physiological insufficiency of the gut, or the diarrhea was dyspeptic and was occasioned by a foreign element. A second group of cases is caused by micro-organisms contained in the food itself. A third group includes the infectious cases, micro-organisms having been introduced from the outside. Still another class will include those cases in which amœbæ of different varieties were found in the dejecta. In summer diarrhea various bacteria probably combined to form a complex etiological factor. Dr. Koplik thought that the group of cases caused by the bacilli of Shiga was limited, and said that clinical experience and bacteriology should go hand in hand in the further study of this subject.

Dr. L. Emmett Holt, of New York, said that Dr. Flexner's studies had shown what might be looked for in a certain type of cases. He thought that unless evidence could be found in the blood it was impossible to say that certain bacteria were the cause of a disease even though the bacteria were present in the stools. Dr. Holt had had a hundred and twenty cases of diarrheas, studied particularly for the bacteria; in thirty-seven of these the bacillus of Shiga was found and gave a blood reaction. There was not a single case in which blood was in the stools in which the bacillus of Shiga was not found; many cases, however, in which much mucus was present in the stools, did not reveal the presence of the organism. In one case the bacilli were present in the stools six weeks after acute symptoms had subsided, in most cases they disappeared in a much shorter period, the reaction being obtained as a rule until the second week. There was no characteristic pathological lesion in these cases. Dr. Holt had used some bacteriolytic serum obtained from Dr. Flexner with some good results. The effect was very transient, the dose (10 c.c.) had to be given frequently. The serum treatment, he said, looked hopeful, it must be given on the clinical diagnosis, as it required forty-eight hours to make a bacterial examination.

Dr. Knox, who was in charge of the Wilson Sanitarium, said that in his experience blood was never excessive in the stools of the acute cases in which the bacillus of Shiga was found. In a few cases no blood was present, the organism having been found in the mucus. He also said that clinically or pathologically he could not differentiate the cases in which the bacillus of Shiga was found from those cases classed as ordinary summer diarrhea.

Dr. Flexner said in closing that the problem was very complex, and that he had not committed himself to any idea except that the bacillus of Shiga occurred in some of the diarrheas. The serum therapy was experimental and attempted to deal with an organism which held its poison closely bound up in its own protoplasm; to be of use it must be used early.

TWO CASES OF ABSCESS OF THE LUNG.—Dr. L. Emmett Holt, of New York, read this paper by title only.

THE INFECTIONS OF THE NEW-BORN.—Dr. S. Mc. Hamill, of Philadelphia, said that the infections of infancy should be classified on a bacterial basis. He gave the details in the histories of six cases that had been studied with Dr. W. R. Nicholson of Philadelphia; in each instance the death of the infant had been due to an extensive bacterial invasion. Staphylococci, streptococci and the *Bacillus coli communis* had been found in the various organs. These germs had been found in the dust of the rooms in which the infants were living, in toilet articles, in the bedding, in the mothers' clothes and in the bath. Careless and poorly trained nurses were probably responsible for most of these infections.

Dr. Hamill said that general aseptic technic of the maternity hospital staff should be insisted on, only regular attendants should be admitted to the wards, these should wear gowns and wash before and after handling the infants. The children should be in a separate ward from the mothers, and under the care of a careful and well-trained nurse. The breasts of the mothers should be watched and the mouths of the infants carefully cleaned.

In the discussion Dr. Koplik said that he did not think it necessary or wise to cleanse the babies' mouths after they had been once cleaned. It was important, however, to keep the mothers' breasts and the bottle nipples clean.

Etiology of Rachitis.—Dr. Roland G. Freeman, of New York, said that the disease had been described for two hundred and fifty years, but even to-day the exact cause was unknown. It is not an affection of the long bones alone, but a general disease found in temperate and cold climates, those suffering most being individuals who come from a hot to a cold climate. Most cases occur in negroes. Race and climate are predisposing causes. The active causes seem to be concerned in the diet. A recent theory was that rickets was due to a lack of fats in food. Experiments on animals by Dr. Herter of New York showed that fat starvation did not cause rickets, but a type of mucoid degeneration, except in cases in which there was an excess of carbohydrates in the food. The fact that many artificial foods contain large amounts of carbohydrates probably saved many babies from mucoid degeneration. Dr. Freeman had studied many infants with rickets, and considered that the most important cause of rachitis was the persistent use of some unsuitable food. He said that the disease was especially common in children who had recently migrated from a warm climate.

Dr. Cotton said that it was rare to find rickets in an infant at the breast. When such a condition was found almost invariably the mother secreted abnormal milk. The proper modification of cow's milk was extremely important, but more study should be given to errors of lactation. Physicians were in the habit of shying at this point; the aim should be to make the mother give good milk.

Dr. S. S. Adams, in discussion, said that rachitis was more and more infrequent in proportion to the education of the physician in the proper methods of modifying milk.

Dr. Miller of Philadelphia emphasized the important part that absence of sunshine and good air played in the causation of rickets.

Third Day—May 14.

Clinic l Analyses of Milk Mixtures.—Dr. D. L. Edsall of Philadelphia gave a brief outline of a series of experiments that he had carried out, assisted by Dr. Charles A. Fife of Philadelphia. He said that accuracy in the per cent modification of milk was so important it was striking that no control had been furnished for such modification. He had found it of interest to make a series of analyses of modified milks that were obtained under varied circumstances, and compare his results with those obtained by the original modifier. He had obtained milk from known and reliable sources and had it modified by known and reliable persons. He also obtained milk from unknown and unreliable sources which had been modified by unknown and unreliable persons. It was found that the fats in the milk modified at a laboratory by reliable persons came very close to the formula, there were few errors of more than .2 per cent. In many of the milk mixtures modified at home by trained nurses the error in the fat percentage was as high as 2 per cent. The percentage of proteids in all cases followed the formulæ more closely than the fats.

In considering the results of milk modification he said that it should be remembered that it is quite impossible to make an absolutely accurate per cent. estimation because the amount of mixed proteids in the best of milk which is supposed to be of constant quality might vary from one-half to one per cent from day to day, while the fats might vary still more. In drawing some conclusions from his experiments Dr. Edsall said that the laboratory milks that he examined were practically free from criticism. The examination of the specimens modified at home indicated that certain definite plans should be followed. The milk and cream should be obtained from a known and reliable source, and only reliable and competent persons should be allowed to make up the mixtures for infant feeding.

FAT AND TOTAL SOLIDS IN MILK.—Dr. Henry L. K. Shaw, of Albany, said that he had made an analysis of thirty specimens of milk to determine the fats and total solids, employing several tests for each sample of milk. Babcock's test, Gerber's test and Holt's cream gauge gave the most constant results. Dr. Shaw recommended a modification of Babcock's apparatus for office use in the determination of fats. Total solids could be determined by the specific gravity and the percentage of fat. By using the sliding scale of Richman the results could readily be obtained without complicated figuring.

Dr. S. S. Adams, in discussion, said that the unreliability of many milk modifications was appalling. He thought that most laboratory inaccuracies were due to carelessness and inefficiency. The most reliable domestic method of modification in his experience was by the use of the conical dipper.

Dr. Chapin of New York attested the value of the Babcock test, and said that it was time that more attention should be paid to milk proteids.

Dr. Cotton emphasized the importance of physicians knowing the quality of the mother's milk, several examinations being necessary before any deductions could be made.

Dr. Edsall said that centrifugal machines were valuable and sufficiently accurate for general clinical purposes. Physicians should examine milk as much as they examine urine.

ABDOMINAL AUSCULTATION IN INFANCY.—Dr. Shaw said that this was a subject rarely mentioned in text-books. In young children and infants the respiratory sounds were transmitted to the abdomen and could easily be separated from the intestinal sounds. A case of lobar pneumonia was described in which râles were heard over the abdomen before they were heard over the chest. Râles from acute bronchitis could also be heard; the more distended the abdomen became the clearer the sounds were heard.

INFANT FEEDING AS BASED ON THE EVOLUTION OF MAMMALS. —Dr. Henry D. Chapin, of New York, said that the main difference between human milk and cow's milk was in the proteids, and whereas these might be nearly of the same composition they assumed different forms. He called attention to some facts relative to the development and early nutrition of the young of mammals. The earliest types of mammals deposited eggs in a nest and nourished the young by the ejection of milk into the mouths of the offspring, the mother having no teats. In others the egg was deposited in a pouch of the mother, where the young animal was developed. The milk was ejected by the mother along the course of certain hairs to the mouth of the young. In still higher types the egg became hatched within the mother, and the young animal after birth, became attached to the mother's teat, the young had no power to suck. In yet higher types the young became attached to the uterine wall and had a placental development. The method of development of an animal seemed to depend somewhat on the ability of the mother for defense. About the third month marsupials became attached to the mother's teat; this corresponds to the time when a woman begins to secrete colostrum. From an evolutionary standpoint it seemed logical to consider an infant as passing through three stages of development, a preplacental of three months, a placental lasting six months and a mammary of ten or twelve months. When a child had been early deprived of the breast it should be considered premature.

Dr. Chapin emphasized the importance of studying the digestive changes which milk underwent in an infant's alimentary tract, and said that the function that milk possessed of developing the digestive tract should be remembered. In conclusion the following considerations were emphasized: (1) In development an infant passes through three stages of development and should be looked upon as attached to the mother in all three; (2) at the beginning of the mammary stage an infant has but a rudimentary stomach; (3) during mammary development the mother changed the character of the infant's food from colostrum to milk, and the infant's digestive secretions so changed the character of the milk that as the digestive juices increased in quantity and strength the work of digestion was increased, for the stronger the gastric juice became the tougher the curds became, due to a combination of the acid with the curds; (4) all milk would produce tissue but it differed in composition with the rate of growth of the young animal. Proteids differed according to the type of digestive tract they were to develop; (5) cow's milk could not be changed to human milk by any known method of modification. In milk modification it must not be forgotten that a food was to be sought for which would develop the digestive tract; (6) a certain minimum amount of proteids, carbohydrates, fats and mineral material was necessary for the nourishment of an infant, breast milk should serve as a guide to the required amount; (7) milk was the most perfect infant food, not only because of its nutritive properties, but because it contained the only proteid that could develop the digestive tract; (8) the proteid of cow's milk was intended to develop the stomach of a calf to digest grass, it must be modified to meet the requirements of an infant; (9) this modification might be accomplished by mechanically or chemically altering the character of the curds by diluting them with alkalis or gruels; (10) when, for any reason, a child could not take a sufficient quantity of cow's milk it should be supplemented by other forms of nucleo-albumins until a normal quantity could be digested, it was an error to attempt to overcome indigestion by feeding too low proteids.

In discussion, Dr. Rotch said that while it was interesting and important to study the different forms of proteid, certain practical principles should not be overlooked. In whey a high proteid and in caseinogin a low proteid could be obtained, a child had a stomach when born, which under normal conditions was able to digest these forms of proteid. Colostrum was an accidental secretion and not milk.

Dr. Chapin said that the casein of cow's milk was not the same as that of mother's milk. In whey, soluble albumins were dealt with and not nucleo-albumins, which were the essential tissue builders. It was not then physiological or a clinical advantage to use whey constantly. Future investigations should be along the line of the proteids and at all times the physician should aim to keep babies at the breast when possible.

A REPORT OF EIGHT CASES OF PNEUMONIA IN INFANTS

TREATED WITH ANTIPNEUMOCOCCIC SERUM.—Dr. John Lovett Morse, of Boston, said that during the last twelve years he had tried many times to obtain a serum of value in pneumonia in man, but results had been unsatisfactory. Dr. Morse described eight cases that had been treated with antipneumococcic serum, the serum having been given in doses of 5 c.c. to 10 c.c. every four hours. From these eight cases he drew the following conclusions: That in no case was there any effect on the temperature; in no case was the disease shortened; in no case was the crisis postponed; in no case was there any effect on the pulse rate; in no case was anything noticed to justify a statement tnat there was any alleviation of the subjective symptoms.

In discussion, Dr. Jennings described a case of pneumococcic meningitis in which the antipneumococcic serum was used. There was no influence noticed on the clinical phenomena of the disease or the subsequent meningeal cultures.

A CASE OF MYXEDEMA.—Dr. George N. Acker, of Washington, described the case of a child that had undergone perfectly normal development up to the eighteenth month. When eighteen months and three weeks old the child had a severe attack of diphtheria. He was not treated with antitoxin. Apparently the child never recovered from this illness, in six months its general appearance began to change, it could not walk, the bridge of the nose became flattened, the legs were flabby and swollen, the abdomen and face were swollen, the face of the child lost all expression, it took no notice of objects and did not know its mother. The child slept well and had a good appetite, it increased in weight but not in length. The anterior fontanel remained open, the hair was straight, coarse and dry, the thyroid gland could not be felt. Harrison's groove was marked, the child kept its mouth open, its tongue was large and flabby, most of its teeth became decayed. Thyroid extract was given in half grain doses three times a day, the dose was gradually increased up to three grains three times a day. The administration of this drug was followed by a marked improvement in all the symptoms.

In discussion, Dr. Koplik cited the case of a child nineteen months old in which thyroid extract was given until it was seven years old, when the treatment was discontinued. In one month the myxedema returned in a most aggravated form, the treatment was immediately resumed. Cases of myxedema must be under constant treatment. Dr. Koplik said that a child could stand large doses if the drug was pure, as much as nine grains three times a day had been given. A rise in temperature might well be due to an impurity of the drug, and was not to be considered an indication for discontinuing the treatment.

A CASE OF CHONDRODYSTROPHY TOTALIS IN A CHILD FOUR-

TEEN MONTHS OLD.—Dr. J. Park West, of Ohio, described a child having a negative family history, which was apparently normal at birth, but subsequently developed a large round head, short thick hands and fingers. When five months old an angular curvature of the lumbar spine was developed. There was occasional sweating about the head, the anterior fontanel and frontal suture remained open, there was slight exophthalmos. The child apparently had about two and a half times as much skin as was necessary, the muscles were soft, all joints were normal, there was no curving of the long bones. A curious feature was a deviation of two fingers to the radial and two to the ulnar side of each hand. The child never made any attempt to sit alone, it had been subjected to various courses of treatment, none of which seemed to alter its condition. The main difference in appearance from a normal child consisted in the length and size of the bones, the only resemblance to rachitis was in the sweating and shape of the head.

PULMONARY OSTEO-ARTHOPATHY IN A CHILD THREE YEARS OLD.—This paper was presented by Dr. T. M. Rotch, of Boston, who had been assisted in the care of the case by Dr. Hunter Dunn, of Boston. A boy, three years old, who had had a normal birth, developed measles when two years old and later had pertussis. He had no general symptoms, nothing especially wrong had been noticed with his pulmonary apparatus. Later he began to cough two or three times an hour, continuing for a year, subsequently the cough became worse and relief was sought at the hospital. He had never been troubled with night sweats or digestive disturbances, his finger tips had begun to enlarge nine months before entrance to the hospital. On examination there was flatness on percussion over the left upper chest in front and dulness behind, loud bronchial breathing, bronchial voice and loud crackling râles were heard over this area. There were no subjective symptoms of disease, the child ran around and played as a normal child. The abdomen was prominent, reflexes normal, blood and urine were normal. The sputum was loaded with Pfeifer's bacilli of influenza. The tuberculin test was negative in its results. It was supposed that there was a consolidation in the left lung and that this might have been due to an unresolved influenza pneumonia.

In discussion Dr. West, of Ohio, reported a similar case of a child three years old that had never been well from birth. When eight months old it began to cough, after an attack of measles the cough became worse, there was a slight clubbing of the fingers, the chest was bowed backward and narrow, coarse râles were heard over the chest, the skin was rough on the finger tips and had been attributed to nail biting. When four years old the clubbing of the fingers was very marked. Improvement followed the use of creosote, given by mouth and by inunctions.

Congenital Gastric Spasm of the Pylorus.—Dr. West also reported this case: The child was seen on the twenty-second day of its existence, it had been vomiting everything that had been taken into its stomach and gave evidence of severe pain. A swelling in the pylorus could be felt, a fact which led to the diagnosis of hypertrophic stenosis. On autopsy a hypertrophic condition was found of the circular muscular layer, a condition which probably exists in most cases of supposed hypertrophic stenosis of the pylorus. Prompt surgical treatment was recommended in such conditions.

The Prophylaxis in the Prevention of the Spread of Vulvovaginitis in Hospital Service.—Dr. Henry Koplik, of New York, considered vulvovaginitis the most annoying infection in hospital practice. Aside from its repugnant features it was a menace to the individual and a source of infection to others. There must always be a definite source of infection, all paths were not yet known, the literature on the subject gave but little data. It had been supposed that the infection was carried by means of napkins, catheters, fingers and other ways, but one thing was certain, that a pure culture of gonococci rubbed on the parts does not always produce the disease. In children a urethritis or a proctitis is prone to give rise to a vulvovaginitis, a chronic scanty discharge was more to be feared, for it was apt to be neglected or overlooked. Any purulent rectal discharge should always be examined for gonococci. Among the many avenues of infection were mentioned bedpans, catheters, nurses' hands and clothing, linens, rubber sheets, wash rags and bathtubs. In an infected case complete isolation should be resorted to, each child having had a careful examination on admission to the hospital. In Dr. Koplik's hospital service every female child had its own wash basin and toilet articles, each bed had a thermometer case attached to it, if a child had a discharge, the thermometer was not used for other children but kept in its own case. A bedpan once used in an infected case was never again used on a clean case. Every female child was protected by a vulvar pad against infection from the hospital linen. All bedding from an infected case was sterilized before it was sent to the laundry and was kept carefully apart from the other bedding. Dr. Koplik took the precaution to have the bed of every infected case marked with a red bandage; no nurse attending an infected case was allowed at any time to touch a clean case.

Dr. Dodson, of Chicago, said that the importance of this affection was not fully appreciated. The patients, he said, were at the mercy of the nurse, nurses were not sufficiently trained in practical bacteriology. The disinfection of appliances used in infectious cases was frequently left with irresponsible persons. He added that the usual injections in these cases were not efficient, remedies should be kept in contact with the parts almost continually.

NASAL INTUBATION (SOFT RUBBER) FOR RELIEF OF DYSPNEA DUE TO ACUTE NASO-PHARYNGEAL SWELLING IN INFANTS.—Dr. Wm. P. Northrup, of New York, described a case of acute swelling of the tonsils and pharynx in an infant causing extreme dyspnea. Syringing was quite inefficient, steam inhalations gave but slight relief, tracheotomy was thought to be the only hope, when it occurred to Dr. Northrup to introduce bits of drainage tubes into the nares. The tubes were inserted about two inches, the procedure being followed by immediate relief. The child sank into a quiet sleep and the tubes were allowed to remain twenty-four hours. When the tubes were removed the child immediately became cyanosed and all the previous symptoms were repeated. In Dr. Northrup's opinion the nasal intubation tided the child over a condition that would otherwise have been fatal.

In discussion, Dr. Morse, of Boston, cited a case of nasal and pharyngeal obstruction in which relief was given by the use of adrenalin chloride.

O'DWYER INTUBATION INSTRUMENTS.—Dr. Northrup exhibited the most recent O'Dwyer intubation sets. The set contained two new small tubes and a fixed obturator so devised that it could not turn on itself.

STILL'S TYPE OF CHRONIC DEFORMING POLYARTHRITIS.—Dr. D. L. Edsall, of Philadelphia, said that Still had described a chronic deforming polyarthritis which was readily distinguished from arthritis deformans. The disease usually appeared before the first dentition as a rule, accompanied with fever and associated with a general enlargement of glands. The affection had no tendency to go on to bony deformity. Dr. Edsall described the case of a boy in which the diagnosis of acute articular rheumatism had been made. The child lived but eighteen months. At the time of death there was an involvement of all joints, most of which were dry and but very slightly movable, there was a tendency to general enlargement of the glands. An injection of tuberculin was followed by a marked reaction, both general and local, in the joints; the reaction subsided in twelve hours. Unless the joints were considered tuberculous there were no other signs of tuberculosis. Tubercle bacilli were found in the glands, but injection of these bacilli into guinea-pigs did not cause tuberculosis to develop in these animals, the bacteria were undoubtedly of low virulence. From these observations Dr. Edsall thought that the disease was probably dependent upon a tuberculous process.

DISTURBANCES OF RESPIRATION IN THE NEW-BORN.—Dr. W. Reynolds Wilson, of Philadelphia, said that the respiratory disturbances of the new-born were for the most part included in the following conditions: asphyxia, congenital atelectasis, dyspnea and rapid respiration. The chief causes of asphyxia were deficient abdominal muscular action, traumatic causes and paralysis of the respiratory center due to toxic influences arising from the alimentary tract.

Dr. Wilson described a case in which he considered the respiratory disturbance to be due to this latter cause, adding that the signs of this disturbance might resemble Holt's fever of inanition. The main causes of dyspnea were congenital malformations, cardiac disturbances, pneumonia, sterilic dyspnea, dyspnea due to enlarged thymus, pulmonary apoplexy, dyspeptic dyspnea which is toxic in origin, and diaphragmatic hernia, which sometimes gave periods of distressing dyspnea. The main causes of rapid respiration were dyspeptic, the common pulmonary affections and systemic infections.

In discussion, Dr. Saunders, of St. Louis, said that gas logs, in throwing out the products of combustion into the room, not infrequently had caused apnea. In cases of apnea he had found flagellation very quick and efficacious, a favorite method being to snap the feet of the child with a rubber band. In case of aspiration of fluid into the lungs great relief might be obtained by making the child gag by tickling the pharynx.

EDITORIAL

ECONOMY IN NEW YORK STATE CHARITIES

During a recent visit to the House of Refuge on Randall's Island, Mr. Jacob A. Riis saw a number of things in that institution that call for more than passing note.

It is perhaps not the province of a journal devoted to the study of children's diseases to enter into the domain of the economics of the State charities, but inasmuch as all those who have to do with the study and training of infants, children and young adults are vitally interested in our custodial institutions, it may not be amiss for us to present to our readers some of the conclusions reached by this well-known investigator.

Mr. Riis found on Randall's Island, in the House of Refuge, some eight hundred boys. These, as is well known, are sent to the island for small felonies and petty crimes, and it is the ostensible function of this institution to so care for the inmates that they may be led to lead better lives in the future and thus not become a burden on the State as criminals.

How illy this function seems to be subserved is well indicated by Mr. Riis' arraignment. He finds the boys crowded, badly clothed, badly fed and so thrown together, pell-mell, that the many otherwise well-meaning but foolish boys are brought into contact and contaminated by a few vicious and morally diseased ones.

Thus, in the words of a recent editorial by one of our leading weekly periodicals, we have, in the House of Refuge, a veritable "Kindergarten of Crime," a place in which the refined methods of petty thieving, pick-pocketing and minor felonies may be taught by the vicious to those of weak or unstable mental organization.

We believe that the suggestion offered by the *Medical News* in its editorial of some weeks past, that all such institutions should be constructed on a radically different plan, is a wise one. The lesson taught at Craig Colony, where inmates are divided into small family groups and can live under conditions more closely resembling normal natural family life should be appreciated and carried into practical operation in our State penal institutions.

Moral contagion is no myth. It is a vital truth, and training in methods of crime, we believe, with our esteemed contemporary, can be rendered nugatory if the inmates of these institutions can be divided into small groups. This permits of a classification along mental and moral lines, and could be run, we believe, as economically as the large *pens* in which we now herd our State charges.

We have heard much of economy under the present Governor's administration, but it seems to us that stinting at this end of the line in the case of the inmates at such places as Randall's Island presages an expenditure of a large amount in the future for the care of our State criminals.

THE AMERICAN PEDIATRIC SOCIETY.

The fifteenth annual meeting of the American Pediatric Society, recently held in Washington, the proceedings of which we give elsewhere in this issue of PEDIATRICS, was a notable one. The work done shows the earnestness of its constituent members, although little that was new or startling was brought forth.

In Dr. Griffith's opening address stress was laid upon the desirability of more research work by the members of the society, and that whereas practical therapeutic papers bearing on infant feeding were of value, he felt that a little more attention devoted to the causes of things would repay the members amply.

One of the most interesting discussions brought out by the meeting concerned itself with the results following Edebohl's operation for nephritis in children. It is too early at this time to say whether this operation in nephritis is to be of permanent value, and there is little doubt that in the hands of inexperienced operators much damage will result, but there were reported some cases at this society in which renal decapsulation was done with good results.

Another important communication was made by Dr. Flexner, who spoke on the bacillus of Shiga and its relation to summer diarrheas. It is becoming more and more apparent that there is a group of organisms clustering about the bacillus of Shiga with similar properties. These are all highly toxic when growing in the intestinal canal, and it seems at the present not too advanced a position to take that cholera infantum, so called, is really due, in part at least, to the bacilli. It was brought out that a bacteriolytic serum was being prepared that promised to give some results in the treatment of this condition.

Abstracts of the other papers will be found in our report taken by our special correspondent, from which it can be seen that the meeting was one of great interest and importance.

ABSTRACTS

Fatal Case of Schoenlein's Disease.—Schönlein's disease, or rheumatic purpura, or peliosis rheumatica, is classified as one of the arthritic purpuras. It is rarely a fatal disease, and consequently its pathology has not been thoroughly studied. Its etiology is still a matter of mystery, but is at present engaging the attention of Osler and others. W. T. Watson (*Maryland Medical Journal,* April, 1903) reports a case because of the comparative rarity of the disease, but more especially on account of its fatal termination and autopsy. A. S., female, aged ten and one-half years, had measles and chicken-pox when quite young, and at the age of six a swelling of the middle of the right leg, which lasted for two or three days. With these exceptions she had always been strong and well up till the advent of her last illness. For two or three months prior to the onset of the disease she occasionally complained of a slight pain in the abdomen, which would pass away in a few minutes. The pain was never severe. She had also complained frequently of headaches during the two weeks preceding the acute attack, but they had not prevented her attendance upon school. On the evening of January 28, while visiting a relative, she was taken with a chill, which was followed by high fever. On the 29th the fever continued, and there was frequent vomiting; no pain. On the 31st, in addition to fever and vomiting, she complained of aching of the arms, legs and back. Small isolated spots like measles appeared upon the arms and on the front and back of the chest; none on the face or neck. The skin over the whole lumbar region was uniformly red and itched intensely. At other places on her skin where pressure was made, as on the thighs when she sat on the edge of the bed, and on the hips when she sat on a vessel, intense redness would appear, soon to disappear. On February 1 the right wrist commenced to swell in the morning, the right ankle in the afternoon. An eruption appeared on the buttocks, thighs, and abdomen. On February 2 he saw the case for the first time. Temperature normal, and no vomiting. The right tonsil was enlarged and inflamed. Both wrists and both ankles were swollen and tender to pressure, the ankles more so than the wrists. There was no rash on arms or chest. On the abdomen there were half a dozen discrete hemorrhagic spots about half the size of a penny. The skin on the buttocks and posterior aspect of both thighs almost to the knees was the sire of a continuous purpuric eruption. On the 9th the joints were normal. The purpuric areas on the abdomen had almost disappeared, while those on the hips and thighs had faded to a dirty brown. Some edema was noticed about the eyes and cheeks and in the skin of the lower part of the abdomen. The urine contained large quantities of albumin. The patient felt perfectly well, and remained in bed only when watched. From this time the history is that of an acute nephritis. The patient was quite comfortable up till about March 1, when the urine became scanty and bloody; the edema rapidly increased and ascites developed. There was diarrhea for a few days, followed by obstinate constipation. She vomited, complained of pain in the back, and slept badly. Her temperature rose on March 5 to 100.5° F., and on March 6 to 100° F., and then remained normal till her death. On March 5 the urine for twenty-four hours was about eight ounces. It was bloody and full of albumin. The quantity of urine diminished steadily till there was almost complete anuria. Dr. Thayer saw her on March 5, at which time the purpuric area was still faintly outlined. There were no cerebral symptoms, the mind remaining clear till the last. On March 12 her heart action became very irregular, and dyspnea became very distressing. On March 13 she died at 6.30 P. M.

Dr. McCallum made the autopsy at 9 P. M. His report is as follows: "Anatomical diagnosis: Acute hemorrhagic glomerulo-nephritis, anasarca, broncho-pneumonia. Body of a girl 130 cm. long. Body walls and legs very edematous. Skin has an ashy pallor. No hemorrhages visible. Marked ascites present; fluid very clear; peritoneal surfaces smooth. Pericardium contains but little fluid. All abdominal viscera extremely edematous. Mesenteric lymph glands slightly enlarged and pink. Heart is somewhat enlarged. All the valves are delicate and competent. Endocardium everywhere smooth. Under that of the left ventricle are a few small hemorrhages. Epicardium is smooth and glistening, but there are several tendinous patches. Coronaries normal. Heart muscle rather translucent; fairly firm. Lungs: Left is bound to the pleura by a few old adhesions. The lungs are practically alike. Pleura shows no fresh exudate. The surface is rather pale, mottled with dark areas. Lower lobes are congested. On section both lungs are very edematous, especially in the lower parts. Scattered throughout there are slightly-elevated, but smooth, firm nodular areas which have a red color depeer than that of the adjacent lung tissue. These consolidated areas are rather larger in the lower lobes. Bronchi slightly congested. Arteries, etc., clear. Lymphatics over surface of lung widened. Spleen is enlarged—11½x6½x4½ cm. It is fairly firm. Capsule is tense. On section the pulp is swollen and velvety; rather pale red in color and slightly grayish. The malpighian bodies stand out as sharply outlined gray marks. Liver is not especially enlarged. Surface everywhere smooth. On section the lobules are sharply enough outlined; cut surface is homogeneous yellow-brown in color. Kidneys: Both kidneys are alike. They are immensely enlarged, measuring each 12x7x4½ cm. Capsule strips off readily, leaving a smooth, pale surface. The surface is rather translucent, and one can apparently see into the substance of the kidney. It is sprinkled with opaque whitish-gray pinhead areas. The surface is also finely sprinkled with minute hemorrhages. On section the cortex measures 8 mm. to 1 cm. in thickness. It is very pale; striations are distinct and swollen in appearance, the translucent striae alternating with opaque yellowish-white ones. Vessels are not especially injected. The hemorrhages are less abundant on the cut surface than on the capsular surface. The glomeruli are especially prominent as gray translucent nodules, almost like miliary tubercles. They stand out above the cut surface like little pearls. The pyramids are quite pale. Other viscera are apparently normal except that there are some small hemorrhages in the mucosa of the ileum, witm minute losses of substance. Microscopically, the kidney shows extensive degeneration in the renal epithelium. Many tubules are partly filled with desquamated and degenerated epithelial cells, while the lining of others is ragged and shows fatty change. The tubules contain, besides the desquamated cells, many hyaline casts, or are sometimes filled with red-blood corpuscles. The glomeruli form the most striking feature in the section. The malpighian tuft is in almost every one much compressed by the new growth of a mass of cells in the area of the capsular space, which forms a crescentic mass. These cells lie in a connective-tissue meshwork which is continuous with the connective tissue outside the capsule. They have often small subdivided capsular spaces lined by capsular epithelium, suggesting that the original capsular space was merely invaded by this new growth. The interstitial tissue is edematous and infiltrated with many nucleated cells of the type of round and plasma cells. Polymorphonuclear leucocytes also occur, and here and there are definite hemorrhages between the tubules. The blood vessels—especially the smaller cortical twigs of the arteriolae rectae—sometimes show an extensive hyaline degeneration of their media, with a dense infiltration of fragmented nuclei in the adventitia. Weigert's stain shows a small amount of fibrin, forming a network in the interstitial tissue here and there—not in the glomeruli."

Early Hereditary Syphilis Without Exanthem.—C. Hochsinger (*Wiener med. Presse,* No. 39, 1902) says that in congenital syphilis the diagnosis cannot depend, as in the acquired form, upon the presence of a skin eruption, as is shown by the author's seventeen cases of congenital syphilitic children, in whom visceral and osteal changes were observed before the appearance of the exanthem. In another group of fourteen cases ranging in age congenital visceral lesions and alterations of the epiphyses, along with hyperplastic rhinitis, were the only lesions observed. In six months, at no time was any exanthem noted. If the virus has been exhausted in the fetal period, we can see If the virus has been exhausted in the fetal period, we can see how the exanthem may entirely fail to appear. Hochsinger relates one case under observation from the day of the birth until its twelfth year, and while changes in the viscera and bones were present early, an eruption failed to appear. In reference to the question whether the mercurial treatment, used as soon as the author's diagnosis of syphilis was made, could not account for the failure of the eruption to appear, the author states that an abortion of the exanthem is not probable, as experience with acquired cases in adults has shown that early treatment fails to abort an eruption, and, secondly, a certain number of his congenital cases which were treated at once for visceral lesions developed within ten weeks the typical specific exanthem.

The author concludes that there exists a congenital syphilis without exanthem, which, however, does not correspond to the parasyphilis of Fournier, but is a true and virulent syphilis. The author further doubts the existence of late hereditary syphilis without previous symptoms in early infancy, as these cases probably belong to the class of visceral and osteal lesions which were overlooked on account of the absence of the eruption. As soon as the diagnosis of congenital syphilis is made the treatment should be begun without waiting for an eruption. Along with the coryza syphilitica other early manifestations are osteochondritis in the form of pseudo-paralysis and the diffuse liver syphilis. In the fourteen exanthem-free cases the former was present in eight cases, the latter in seven cases. In all cases the spleen was enlarged.—*Maryland Medical Journal.*

Pertussis and the Early Blood-Findings.—ALFRED WANSTALL (*American Medicine,* January 10, 1903) has examined the blood of nineteen children ranging from seven months to eleven years of age, all of them suspected at the time to be in the catarrhal stage of whooping cough. Fifteen of the nineteen cases, from their subsequent history, proved to be cases of pertussis, and four of them did not. The average number of leucocytes was 6698. A differential count of the leucocytes in eleven of the fourteen cases of pertussis showed the lymphocyte percentage *exceeded that of the polynuclear neutrophilic leucocyte.* It is particularly interesting that the mononuclear leucocyte percentage exceeds the polynuclear neutrophile in these cases of pertussis almost as much as the polynuclear neutrophilic exceeds the mononuclear in all other diseases of children. This increased lymphocytosis during the catarrhal stage is of importance in the diagnosis, as pertussis is very contagious during this stage.

The Differential Leucocyte-Count in the New-Born.—L. M. Warfield (*New York Medical Journal*, September 20, 1902) concludes that (1) The leucocytes at the day of birth are more numerous than at any other time of normal life. (2) Nucleated red-blood corpuscles rapidly disappear from the circulatory blood of the healthy infant within the first three days of life. (3) The percentage of the eosinophiles varies widely in the blood of babies of the same age. (4) Myeolycytes and most cells are only occasionally found, and are in very small numbers. (5) The percentage of large mononuclear and transitional cells is large compared to that found in the blood of adults. (6) The polymorphonuclear cells at birth are not only relatively, but absolutely increased. They begin to decrease in numbers soon after birth, and by the eleventh day of a healthy infant's life they are fewer in number than the lymphocytes, while the number of the latter variety of cells has actually increased, and the differential count of the leucocytes on the eleventh day is practically identical with the count given in the textbooks as normal for the infant's blood.

The Blood in Measles and Scarlet Fever.—Reckzth (*Zeitscrift f. klin. Med.*, Vol. XLV, No. 1) says that in a series of methodical blood examinations in sixty cases of measles and scarlet fever he found some interesting conditions, especially as to the eosinophiles, and these were important for an early differential diagnosis. Whereas in measles there was constantly found a diminution in number of eosinophiles, in scarlet fever a decided eosinophilia was always observed. A further fundamental difference between the two diseases was noted in the total leucocyte-count. While a hypoleucocytosis was noted in measles, scarlet fever showed a hyperleucocytosis. However, in measles the characteristic picture can be obscured by complications, showing a leucocytosis, generally a lymphocytosis. Scarlet fever usually shows a diminution of red-blood corpuscles, an anemia which is seldom present in measles.

Joint Affections in Hemophilia.—H. Vulliet (*Revue Médicale de la Suisse Romande*, 1902, Vol. XXII, p. 826) says: Although only of rare occurrence, the affections of the joints in hemophilia are of great importance from a diagnostic point of view, and many patients have lost their lives through surgical interference based on an erroneous diagnosis of the etiology of the joint condition. Three stages can be distinguished in their evolution—in the first period the joint, without any appreciable injury, suddenly becomes the seat of an effusion of blood, which is slowly absorbed, sometimes even completely disappearing, but usually tending to recur again and again. Then follows the second stage, a reactionary synovitis, characterized by alterations at first in the synovial membrane, later in the cartilages. The membrane becomes thickened, covered with fibrinous deposits, and even free fibrinous masses may be found in the joint cavity. The cartilages lose their polish, become opaque, and later on eroded. In the third stage the destructive lesions have been repaired by fibrous tissue, and ankylosis, partial or complete, has taken place, often in a faulty position, with dislocation and contractures. The affection is almost always confined to the knee-joint, and requires to be distinguished from tuberculous arthritis. In the first stage it is liable to be confused with "tuberculous hydrops," but in the latter the effusion is less abrupt in onset and less rapid, and the condition remains stationary for a long period, or progresses only very gradually, and not by sudden exacerbations as in hemophilia. In the second stage diagnosis from a tuberculous synovitis is still more difficult, but in the latter the general health is affected to a greater degree, and the thickening of the synovial membrane and articular ends of the bones is better marked. In the third stage of ankylosis and deformity the two conditions cannot be distinguished by physical signs. In all signs the previous history of the patient requires careful investigation. The treatment is absolute fixation of the joint, with compression. If tension is extreme the effusion may be tapped, but arthrotomy or other operation must never be performed, as in hemophilia any such procedure would be certainly fatal.

Temporary Resection of the External Orbital Wall.—DOMELA (T.) (*Revue Médicale de la Suisse Romande,* 1902. Vol. XXII, p. 833). The sacrifice of a healthy eye in order to reach the retrobulbar region seems rather a drastic measure, yet it has been frequently performed, and has received the sanction of Graefe and others. The attempts of Crichett, Bowman and Knapp to achieve the same purpose by passing between the bulb and the orbital wall have been successful in some cases, but the field of operation is very limited, and only very small and well-defined tumors can be attacked in this way. Krönlein was the first to practise a temporary resection of the outer wall of the orbit as a means of access to the retrobulbar structures. A curved incision is made in the temporal region with its convexity forwards and slightly downwards, commencing at the anterior part of the temporal crest, 1 cm. above the superior margin of the orbit, extending down along the outer orbital margin, almost as far forward as the outer orbital margin, almost as far forward as the outer canthus, and terminating on the zygomatic arch midway between the outer canthus and the auditory meatus. It is carried down through the skin, aponeurosis and muscles, and along the outer orbital margin divides the periosteum. The periosteum is now separated with a rugine from the outer orbital wall as far backwards as the spheno-maxillary fissure below and a few millimeters behind the spheno-malar suture above, and is gently retracted along with the orbital contents. The exposed outer wall is now divided along three lines—(1) above, from the external orbital process of the frontal bone horizontally backwards; (2) posteriorly from the posterior end of this line obliquely into the spheno-maxillary fissure; and (3) below, from the base of the orbital process of the malar bone horizontally backwards to the anterior end of the spheno-maxillary fissure. The osseous fragment, with all the adherent soft parts, is luxated outwards and backwards, the orbital periosteum is incised horizontally, the external rectus is easily distinguished, and the retrobulbar region well exposed. At the conclusion of the operation the orbital periosteum is sutured, the osseous fragment replaced, and the wound closed.

The writer has collected and analyzed the results of 45 operations of this kind; one patient died soon after operation from invasion of the cranial cavity by the tumor, and in six others it was necessary to completely remove the orbital contents.

Mixed Diphtheria Infection.—Dr. G. W. Mylks (*Kingston Med. Quarterly,* 1903, No. 1), reports the case of Flora S., aged four years, who on the evening of December 9, 1902, was admitted to the Nickle Wing of General Hospital. He had seen her late in the afternoon and found a temperature of 104.2 deg. F., pulse 118; and respirations 20. On examination of the throat a small grayish patch about the size of a pea could be seen on the right tonsil. The glands at the angle of the jaw were enlarged and hardened and the constitutional depression seemed to be extreme. After her removal to the Hospital, 2,000 units of antitoxin were administered by the hypodermic method. A spray of hydrogen peroxide was ordered for local treatment and a mixture of tinc. ferr. mur. and liq. ammon. acet. dil.—prescribed for internal administration. Small fractional doses of calomel and soda were also begun. On the following morning the temperature was 99.8 deg. F.; pulse 108. No perceptible change in condition of throat or glands. During the day the temperature went up and in the evening reached 102.6 deg. F. The following day (Dec. 11), the morning temperature was 99.8 deg. F., and the evening temperature 103.2 deg. F. Such an intermittent temperature at once pointed to septic infection The throat did not improve. The small patch of membrane still remained and occasionally branched out in a forked manner, reaching obliquely forward from the right tonsil to the under surface of the soft palate in front of the uvula. Dr. W. T. Connell made a bacteriological examination of the exudate and reported as follows:—Diphtheria bacilli present though in small numbers; streptococci predominating.

Two days later (Dec. 13), the high evening temperature still persisting a further dose of antitoxin (1,000 units) was administered, The temperature and pulse record on the following day showed in the morning, temperature 102, pulse 108; and in the evening, temperature 103.8 deg. F., pulse 108. The next morning (the 15th), the temperature dropped to normal, pulse 104, and we were gratified to notice the complete disappearance of the membrane. However, the temperature soon rose and the same evening (15th) registered 103.8 deg. F.; the membrane was again appearing on the throat. At 7 p.m. another dose of 1,000 units of antitoxin was given. The next day the temperature remained at 99 deg. F. all day and no change in the condition of the throat could be noticed. The child was very much depressed; very pale and listless despite the strong stimulation that was being carried out. On the 17th the temperature again began to rise and in the evening reached 103 deg. F.; pulse 126, very feeble, and the child's general condition alarming. The next morning (the 18th) the temperature was 103.4 deg. F.; pulse 134, and the local and general symptoms mostly aggravated. As a last resort it was thought advisable on account of the mixed nature of the infection and the septic course, to try administration of antistreptococcus serum. Accordingly at 12.30 p.m. 10 c.c. were administered hypodermically. On the following morning the temperature registered 99.4 deg. F.; the membrane had disappeared from the throat and the glands were not so markedly swollen. During the day (19th), the temperature rose slightly, reaching 100.4 deg. F., at 4 p.m. At 8 p.m. it had dropped to 98.4 deg. F., the first normal evening temperature, since the commencement of the illness. On the following day (the 20th), the temperature remained normal; the throat began to lose its congested appearance; the glands were regaining their normal size and consistence. The child improved rapidly and passed on to a complete recovery.

The Curative Effect of the Vapors of Formalin in Whooping Cough.—Dr. Jezdik Cenex (*Zeitung der boehmischen Aerzte*, Prague, Sept. 14, 1902) says that after he had frequently proved that vapors of formalin had a curative effect upon various infectious catarrhs and influenza, he also tried to treat whooping cough as soon as a favorable opportunity offered itself. In the summer of last year he found in a family a nurse girl, only fourteen years old, who on account of a very rough cough had been sent from school and taken into service. The child she attended very soon became ill. The girl must have had the cough for many weeks; it was of a distressing nature, and frequently ended in vomiting. The attacks mostly occurred during the night. Without trying any other medication, he placed the child with the girl in the sitting-room, lighted the formalin lamp and evaporated four or five tablets per 1,000 cubic feet of air space. The children remained in this room for about half an hour; they were then taken from the room, which was disinfected by a larger number of formalin tablets, about thirty to 1,000 cubic feet. Shortly after this the children appeared paler, and also had less appetite. There was a little irritation of the eyes, which had a sleepy appearance. Any other symptoms which could indicate any harmful effects of the formalin vapors he did not observe. The same night after the formalin inhalation the girl coughed very much less, and afterwards not at all. The child had lost its cough entirely. After this experience and other trials with the formalin vapors, and the knowledge which he had gained in the continuous use of formalin for the disinfection of my ordination and consulting rooms and also of the houses of his patients, he was induced to adopt a systematized use of the vapors of formalin for curative purposes. His patients inhale the formalin vapors in the sitting-room, and after retiring the room is thoroughly disinfected by an increased quantity of formalin gas (about thirty tablets to the 1,000 cubic feet), evaporated from Schering's formalin lamp. Sometimes he has found that children, after the inhalation, become a little sleepy, which may, however, be explained by the slight irritation of the conjunctiva. From his experiences he concludes: (1) By the proper inhalation of the vapors of formalin it is possible to destroy the germs of whooping cough—those existing on the mucous membrane of the respiratory organs and also those in the surroundings of the patients. By this means the disease is cut short and further infection inhibited. (2) If it is considered that the removal of the patient in whooping cough acts beneficially upon the disease, it is only reasonable to expect that the disinfection of the patient's dwelling is sufficient to frequently effect a cure. (3) In accordance with these experiences it seems advisable that schools, hospitals, churches and other localities should from time to time be thoroughly disinfected.

Oxygen in Diphtheric Stenosis.—It has been the experience of HECHT (*Jahrbucher f. Kinderheilkunde,* LVII, Feb.) that the respiration was favorably affected in two out of nine cases of diphtheric laryngeal stenosis. Study of the details of these cases shows that inhalation of oxygen is always indicated when the heart action is growing weak, which condition is evinced by tachycardia. It should be continued until the heart action decreases and, of course, be suspended if it tends to increase the tachycardia.

Phosphaturia.—DR. DE LANGE reports the case of a little girl, not quite five years of age, who suffered with phosphaturia during the nine months in which she was under observation.

There is a possibility that this was due to some connection with helminthiasis to which she was subject.

Rare Forms of Infantile Cardiopathy.—Of the cases described by HOCHSINGER (*Jahrbucher f. Kinderheilkunde,* LVII, Jan.), radioscopy is the cause of the contradictory symptoms. In one they were due to the defective development of the septum in the common arterial trunk. The infant was eleven months of age, and showed congenital cyanosis. The origin of the arteries was also on the opposite to the normal side, and the first portion of the aorta was developed rudimentarily, while there was vicarious enlargement of the pulmonary and permeable ductus arteriosus, with hypertrophy of the heart as a result. In the second case, a boy of thirteen years, there was still an opening of the ductus arteriosus, with an aneurismal dilatation of the pulmonary artery and congenital stenosis of the isthmus of the aorta. In another case, an enormously hypertrophied heart was exhibited in a boy of nine years together with adhesions between the pericardium and chest walls constituting signs of obsolete tuberculous pleurisy. The mitral and aortic valves were also insufficient and the entire heart was displaced to the left and fastened by tuberculous bands.

Rocking Chair for Weakly Children.—It is recommended by DR. A. EPSTEIN (*Jahrbucher f. Kinderheilkunde,* Berlin, LVI, 6) that a low rocking-chair with arms and a broad open space between the back and the seat be used for developing the muscles and for strengthening the back of children from one to three years of age. By sitting in this chair, facing the back, with feet dangling or touching the floor or resting on a step placed across the long wooden rockers for the purpose, the child learns to balance himself and rock. As he holds on by the back and arms and rocks, the movement causes him to hold his head erect and makes his spine straight, while the pleasure derived from the exercise incites him to renewed efforts.

A Case of Persistent Ductus Botalli.—After reviewing the literature on this subject, LIDLAUER (*Arch. f. Kinderheilkunde,* Vol. 34, Nos. 5 and 6, 1902) describes the case of a little girl four years of age, who was suffering from cardiac hypertrophy, diastolic thrill and murmur at the pulmonary area, general arrest of development, osteoma of the upper border of the scapula, bradycardia and rapid respiration. There was no cyanosis. The condition of the heart was first noticed at the end of eleven months. Lidlauer based his diagnosis of persistent ductus Botalli upon the diastolic murmur and thrill, which was longest in the pulmonary area, due to defects of the aorta and pulmonary arteries; hypertrophy of the right ventricle, dulness along the sternum, rapid pulse with intact aortic valves, and the absence of cyanosis and all signs of congestion. The prognosis in cases of this kind is favorable.

The Diffusibility of Scarlet Fever Virus.—JOHN SUTHERLAND (*The Lancet,* Jan. 10, 1903) says that in conducting an inquiry lately in an epidemic of scarlet fever directed mainly towards the question of diffusibility of the virus he was struck with its low diffusibility. In the literature of scarlet fever it is generally assumed that this exanthem is carried and propagated by various media, *e.g.,* fomites, visitors, etc. Scarlet fever is intensely contagious, and throughout the whole course of the epidemic only one instance was noted of a susceptible (that is, a child unprotected by a previous attack of scarlet fever) child escaping the disease after contact with a desquamating case. The diffusibility, to some extent, must depend on how long the virus can survive and retain its striking power after its dissociation from a desquamating subject exposed at the same time to ordinary conditions. In the present inquiry the author observed 224 cases of scarlet fever occurring in 132 households. The following is a short summary of the result:

Division I.—Ten families either could not or would not keep the infected children apart from the others; so second cases occurred in every one of these homes after intervals of two to fourteen days.

Division II.—In forty households the patients were either the only children of the house or the only susceptible ones. This group, therefore, affords no data.

Division III.—In thirty-four families a very well-intentioned attempt at isolation was begun and maintained for periods ranging between twenty-one and forty-three days. In all cases, however, in which the infected and susceptible children got together a second case of the disease was noted.

Division IV.—In forty-eight families this home isolation proved pre-eminently successful. Susceptible children lived in each of the forty-eight houses, and they all escaped. In all these houses the mother was obliged to act as nurse and housewife, and go from the sick child to other members of the household; still no transmission of the disease occurred.

The author concludes from his investigations that a healthy nurse or attendant on a scarlet-fever case does not, under ordinary circumstances, carry the infection of scarlet fever even from one room to the other.

Clinical Value of Blood-pressure as a Guide to Stimulation in Sick Children.—Cook, in a previous number of the *Maryland Med. Journal* (January, 1903), in association with Briggs, published an interesting article on the value of an accurate knowledge of arterial blood-pressure to the clinician. In a more recent article (*The American Journal of the Medical Sciences,* March, 1903) he pays especial attention to the value of blood-pressure determinations in the case of sick children, especially as a means of determining whether or not they should be stimulated. These investigations were made at the Thomas Wilson Sanitarium for Sick Children, situated near Baltimore. The instrument used to determine the blood-pressure was a modification of the original Riva-Rocci sphygmomanometer, the principle of this instrument being a continuous system of air so arranged that equal pressure can be transmitted from a rubber bulb held by the operator to a band placed around an arm or leg of the patient, and at the same time connecting with a mercury manometer, which registers the pressure in millimeters. The instrument is easy of application; so easy, in fact, that comparatively accurate observations can be made by nurses, and the limit of error is slight—according to whether a sick child needs stimulation or not, and whether he is overstimulated. "During the first few months the pressure averages about 70 or 75 mm., and during the last half of the first year 80 or 85 mm., but lower than 60 mm. is rare except where the need for stimulation is urgent. During the second year a pressure from 80 to 90 mm. may be expected, and in the third year the range is between 90 and 100 mm., and does not go much above 110 mm. during childhood. The blood-pressure of children is a much more absolute quantity than in adults, when such factors as difference in musculature and arteriosclerosis make great variations. Children from three to ten years, in health, lying at rest, have a blood-pressure that seldom varies between wider limits than from 95 to 115 mm., and for any child between these ages 85 mm. simple palpation of the pulse is not practicable in determining of the investigation was to see if a more accurate method than the Hensen, not more than three millimeters in children. The object would be considered moderately low, 75 mm. low, and 65 mm. very low." A rise in blood-pressure was noted shortly after feeding, this appearing to be similar to that noted by Crile, Cushing, and others after any abdominal compression, while crying, restlessness or any manifestations of excitement were often also accompanied by a rise in blood-pressure of 5 or 10 mm. in a healthy child. It was also noted that during the early morning hours there may be a fall in blood-pressure, while in the early evening hours the blood-pressure reaches its maximum. After the administration of strychnia a rise in blood-pressure of usually 10, occasionally 20 to 30, mm. took place, lasting in some cases six or eight hours, although a shorter time in the most ill patients. The action of digitalin in equal doses seemed to be more immediate and rather more sure to cause a higher rise in blood-pressure, which was maintained, however, a shorter time, from one to three hours. The effects of alcohol were rather inconstant, sometimes bringing about a rapid rise, at other times no rise at all, although under repeated doses many cases showed a gradual, steady and well-maintained rise in blood-pressure. Thus, where the demand for a stimulant is only moderate it would seem best to start with alcohol in doses from 5 to 30 drops, according to the age of the infant, given well diluted and repeated every three or four hours, while for cases that do not improve on this, strychnine in doses of 1-400 to 1-200 of a grain should be administered, and if the heart becomes irregular or very rapid, digitalin in the same dosage may be added. In the case of infusion of normal salt solution, in no case was the blood-pressure more than very transiently raised, though the administration of this solution was undoubtedly beneficial by assisting the elimination of toxins and by supplying fluid to the tissues. Cook found the blood-pressure determinations especially valuable at night when the following orders were left with the nurse in charge of the case, the pressure being taken every two hours: "If the pressure falls to 80 mm. give 1-200 grain strychnine; if to 70 mm., 1-200 grain strychnine and 1-200 grain digitalin; if to 60 mm., call the physician; if above 105 mm., omit the dose of alcohol." Cook concludes that "from the results of stimulation in toxic conditions in children I do not feel justified in drawing conclusions that similar effects would occur in other conditions of circulatory depression, such as hemorrhage, surgical shock, nor in adult morbid states, as the erroneous impressions of the clinical action of drugs as derived from physiological experiments tend to make one cautious in prophesying for stimulants similar action in different morbid states, or in the same morbid state under different conditions, without carefully observing each by itself. It would seem, however, that in formulating correct judgments of drugs, especially stimulants, blood-pressure observations will be found of great value, as they afford a trustworthy numerical basis from which to work. Observations on blood-pressure following these lines are now being made by Dr. J. B. Briggs and the author in the wards in the Johns Hopkins Hospital, and will be reported later. I wish again to insist, however, that it is not meant that blood-pressure observations in any form of treatment should take the place of other signs and symptoms, but merely that an accurate estimation of arterial tension furnishes an additional and not invaluable aid to stimulant therapy."

PEDIATRICS

VOL. XV. AUGUST, 1903 No. 8

ORIGINAL ARTICLES

DISEASES OF CHILDREN DUE TO FAULTY NUTRITION[1]

INFANTILE RHACHITIS, INFANTILE SCORBUTUS AND INFANTILE ATROPHY

BY WILLIAM NORBERT SULLIVAN, M.D., OF SAN FRANCISCO.

The symposium of which this paper is a part has for its object the consideration of the nutrition of the infant. The subjects of proper milk supply and milk modification have received attention. It remains for me to present the result of a study of the diseases of infancy which are associated with faulty nutrition.

If we investigate the etiology of rhachitis we find that a variety of causes are described and furthermore that we may almost take our choice, for, as Strümpell says, "Although the clinical and anatomical phenomena of rhachitis have been often and accurately investigated the true cause of the disease still remains entirely unknown." He speaks of the lactic acid theory and of the influence of phosphorus and lime. He refers to Oppenheimer's malarial theory and to the theory of heredity, the proof of which latter, he says, is lacking. Osler refers to the geographical and racial conditions operative in the causation. In Vienna and London, he says, 50 to 80 per cent of all the children presenting at clinics are rhachitic. A starchy diet, too much cow's milk and indiscriminate feeding; but, he continues, something more is required beyond these, for the children of healthy parents who have ample quantity of proper food may become rhachitic. He says that there is no evidence that the disease is hereditary, but there is probably a fetal form.

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[1] Read before the State Medical Society of California, April 23, 1903.

As the real issue of this paper is to show the relation of improper feeding to the diseases considered I have stepped aside from the multiplicity of theories and searched for support of the view which maintains that improper feeding is the chief etiologic factor in the production of rickets, scurvy and marasmus.

Dr. Charles O'Donovan, in giving a representation of the relation which food maintains to the production of rickets, cites a case which is illustrative of the manner in which a great many rhachitic subjects are fed in infancy. He says: "The mothers are impressed with the idea that the food for the child must be 'strong,' and consequently give the child anything but milk just as soon as this is possible, and have as a result gastro-intestinal irritations and in the majority of cases rickets." One child was brought to him fourteen months old weighing nine pounds. It was rhachitic, extremely feeble and undeveloped without teeth. Yet the child had been born healthy and had grown as long as the mother nursed it, and not until it was given all sorts of food did it become rhachitic. At about five months it began to eat potatoes and cabbage and any other vegetable or meat that happened to be on the table, and soon, much to the surprise of the family, it began to show signs of distress. "Teething" was accused of the trouble and the child had been "teething" ever since without the development of a single tooth. When the woman was asked if she gave the child milk, she said that milk always disagreed with it and was refused. This was not so, for when the child was taken to the hospital and placed on a milk diet it improved forthwith.

In reviewing the papers presented in the last twenty years on the relation of improper feeding to the production of rickets we cannot help but note that the element of fat seems to bear a relation to the causation of the disease. It is claimed that rhachitis does not exist in Japan and the explanation advanced as to the reason of this, is that the Japanese have always eaten plentifully of the fats and oils of fishes, the blubber of whales, the eel and the loach. Among animal experiments we find that Guerin gave puppies a diet of meat for months. They became rhachitic. Other puppies which were suckled did not. At a meeting of the British Medical Association, held in August, 1888, Dr. W. B. Cheadle read an instructive paper on rhachitis in which he said that the feeding of young animals in the Zoological Gardens strongly supported the theory that deficiency in animal fats and earthy salts is the most important factor in the production of rickets. In the Zoological Gardens young monkeys were taken from their mothers and fed with a diet of vegetables and fruits. They became rhachitic. Two young bears were fed with rice, biscuits and occasionally with lean meats which they licked, but rarely ate. They died of extreme rhachitis while still young. Cheadle states that 20 litters of lions died successively of rhachitis, and the next brood were fed on cod liver oil, purified bones and milk. The addition of fat and bones to their diet caused a change, and eighteen months later, when the young lions were last examined, they were apparently healthy. J. Lewis Smith concludes from this that the more the causation of rhachitis is elucidated by observations on man and experiments on animals the stronger is the evidence that the cause is dietetic.

Garrod and Fletcher in England have studied "The Maternal Factors in the Causation of Rickets," and state that many other causes than dietary ones are active in the etiology. They enumerate 8 chief ante-partum causes and 3 chief post-partum causes, apart from the errors in dietetics, which appear to them to influence the origination of the disease in the infant. They cite a case in each instance and in each instance aver that the food was beyond reproach, consisting of either breast milk or sound dairy milk diluted. But as against this position we may justly follow the work of pediatrists in this country who affirm that sound dairy milk, unless properly modified, is not always a sound food for the child, as it not only varies in its consistency, but also in the character of its constituents as compared with woman's milk. Dr. Sherman, in a paper read before this Society in 1896, shows the difference by Leeds' analysis:

	Sound Dairy Milk.	*Woman's Milk.*
Reaction	feebly acid	persistently alkaline.
Specific gravity	1.0297	1.0313.
Bacteria	always present	absent.
Fats average	3.75	4.13.
Lactose	4.42	7.
Albuminoids	3.76	2.
Ash	.68	.2.

Leeds sums up as follows: on an average human milk has one-half of one per cent more fat than average sound dairy milk, and two and one-quarter per cent more lactose. On the other hand it has one-half of one per cent less mineral matter and, what is more important, but two per cent of albuminoids, or about one-half as much as cow's milk. In each case the albuminoids consist of casein and lactalbumin. The former is precipitated by acid, and the latter by heat, but the coagula formed by cow's casein are large and coarse clots, those formed by woman's casein are finely divided, soluble flakes. Moreover there is about four times as much casein as lactalbumin in cow's milk, and about twice as much lactalbumin as casein in woman's milk.

It is from considerations of this kind that we are impressed with the value of Rotch's formulæ whereby the nutrition of the individual child is made an object of study and the component parts of the dietary are prescribed according to the absorptive and assimilative powers of the child. Therefore the treatment of rickets is chiefly dietetic. Drugs may be useful. Cod liver oil is the remedy on which we mostly rely. Phosphorus is of doubtful utility.

Scurvy—Infantile scorbutus is a disease whose history is quite interesting to the student of medical literature because, although the disease has existed for a very long time, or as long, probably, as the other infantile diseases, its true nature escaped observation until a very recent period. While, undoubtedly, the disease was known in England it was confounded with rickets and designated acute rickets and called Barlow's disease. But in 1894 Northrup and Crandall, in a most interesting and instructive paper, pointed out that there is probably no such disease as acute rickets, and that cases presenting symptoms known under the head of acute rickets are either rickets associated with scurvy or they are genuine scurvy unaccompanied by any other disease.

Scurvy may appear at any period of infancy or early childhood, but is most common between the ninth and the fourteenth months of life. It is characterized by lesions of a hemorrhagic nature due probably to diapedesis, especially subperiosteal hemorrhages, hemorrhages into the muscular tissues, into the skin and mucous membranes. Lack of fresh food is the most important cause. The use of proprietary foods and condensed milk produce more scurvy than all other methods of feeding. Anemia and malnutrition are accompaniments; a peculiar sallow complexion is a feature.

Scurvy is frequently superadded to rhachitis, but in a large number of cases no evidence of rickets is present. So-called acute rickets is, in most cases, and probably in all, rickets complicated by scurvy. Pain is a constant symptom. It develops early and is usually intense. One of the peculiar features of the disease is a varying degree of immobility of the extremities which is frequently so marked as to simulate paralysis. This pseudo-paralysis disappears with the subsidence of the scorbutic condition.

Subcutaneous hemorrhages, as well as hemorrhages from the cavities of the body, are common. The condition of the gums is characteristic. They are purplish, soft, spongy and bleeding and frequently show decided ulcerations. When the teeth have not been erupted changes in the gums are either slight or entirely absent. Painful swelling of the lower extremities is the most common symptom; the upper extremities are rarely involved. The thigh is affected more frequently than any other region.

Children suffering from scurvy commonly present the following symptoms: anemia, intense pain on motion, spongy and bleeding gums, swelling of the lower extremities, usually of the thigh. There may be also purpura or ecchymoses, discharge of blood from the various cavities of the body and pseudo-paralysis.

Scurvy when untreated is a very fatal disease; when recognized and properly treated a rapid and complete cure is effected. The result of antiscorbutic treatment is, in fact, one of the most certain means of diagnosis.

Scurvy may be mistaken for rheumatism, stomatitis, rickets, sarcoma, osteitis and infantile paralysis.

Scurvy is a dietetic disease and must be cured by dietetic treatment. Fresh milk, beef juice and orange juice are the most effective remedies.

Marasmus—Infantile atrophy is a disease in which extreme atrophy of all the muscular tissues takes place without, as far as we are able to make out, any disease of other organs. The cause is unknown. It may be dependent on grave intestinal disturbances of toxic or organic origin.

Pathologically the lymph glands have received some attention in this disease. They are found somewhat enlarged at times. The mucous and submucous tissues of the intestines show atrophic changes.

The symptoms are those of starvation. Emaciation is the prominent symptom. The appetite is lessened, the temperature is normal or subnormal. The pulse is weak and the respirations are generally normal. There is vomiting and the weight diminishes and the infant may die from exhaustion.

The diagnosis is from general tuberculosis, from which it is diagnosticated by its response to good food. In the ordinary cases of starvation, which result from improper food or from lack of food a diet, carefully adapted to the age of the child, is soon followed by rapid improvement.

The prognosis is bad especially during the first year of life.

The treatment consists in such modification of the milk as to promote intestinal absorption and without drugs. After experimenting with a number of cases Rotch modified the milk thus: a mixture was given which contained a low percentage of fat, a high percentage of sugar and a moderate percentage of proteids.

Fat	.45
Sugar	6.00
Proteids	1.00
Lime water	5.00

After the infant has begun to gain in weight the percentage of fat is increased, but for a number of weeks it is not raised above 1 or 2. When the infant has once begun to gain steadily in weight the power of absorbing fat is rapidly increased and the percentage of fat, sugar and proteids can then be somewhat raised thus:

Fat	3.00
Sugar	7.00
Proteids	2.00
Lime water	5.00

Conclusions—In concluding I may say that as it was my intention to deal only with the relation of improper feeding to these diseases, I have not attempted a description of the interesting pathology of rhachitis, of its symptomatology, of its prognosis or of its diagnosis, as these subjects are wide in their scope and require time for their consideration. Furthermore I have not given much attention to the part played by proprietary foods in the production of these diseases, because of their variation from woman's milk, which is usually so great that they receive consideration from nearly every author who writes on these diseases. The part played by fat in its relation to rhachitis and to infantile atrophy seems to me to be deserving of notice.

Of late Kassowitz and Stoeltzner have given considerable study to the cellular pathology and biology of rhachitis in search of its true etiology. Ritterhain, Pfeiffer and Henoch have studied the disease in its relation to heredity. But whether the true light will be thrown on the etiology from the realms of cellular pathology and biology, or whether heredity plays more of a part in the causation than we have heretofore granted to it, the fact remains the same, that improper feeding bears a definite relation to the production of rhachitis as it does also to infantile scorbutus and to infantile atrophy.

OF WHAT VALUE ARE DRUGS IN THE TREATMENT OF CHILDREN?

By Dr. Frederick Leavitt,

ST PAUL, MINN.

I take it that at the meeting of a scientific body like this we may, upon occasion, safely spend a little time in reflection; and, instead of always marching forward as I know it is our aim to do, act wisely, and call a halt that we may see where we are at. So, for a few moments let us stop and reconnoiter. Since it is so much easier to ask questions than it is to answer them, and more natural—for some people—to condemn than to commend, I propose in this instance to do that which is both easy and natural.

The question is asked: Of what value are drugs in the treatment of children? This is putting the subject in rather a negative light, perhaps, and might suggest to your minds that all drugs are, viewing them from such a standpoint, somewhat under a cloud. I am not prepared to take such a stand, however, though I have sometimes felt with Dr. Oliver Wendell Holmes who said many years ago that, excepting opium, a few specifics, chloroform and ether, he believed that if the whole materia medica were sunk to the bottom of the sea, it would be all the better for mankind—and all the worse for the fishes.

Of concocting many drugs there is no end. If we add to this the great number of medical journals which must, in order to fill their columns, publish every new plan of treatment and exploit every new drug, is it much wonder that our heads become filled with a host of remedies and we grow skeptical and unwilling even to give them a trial?

Let me ask another question: Are there not those among us who have had patients, perhaps in our earlier practice, that were made worse by medication? And, going a step further, can we remember many instances of sick children who were benefitted by

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[1] Read before the Minnesota State Medical Society, June, 1903.

drugs alone? And, finally, is not the drug we administer oftentimes some senseless makeshift given to pacify our subject's mind —generally the father or mother of the child being treated—looking all the while for nature, the best physician of all, to come with her timely aid? With due respect to the members of this society, I venture to assert that we are all guilty of sometimes giving a dose of calomel on the same principle upon which we order a steak and coffee at the restaurant—because we cannot think of anything else quite so handy.

The practice of medicine, though making progress as the years go by, is still an art and not a science. Indeed there is little exactness and few absolutely settled facts upon which to build a science; therefore we shall have to be content to try and keep on trying for a long time to come. We prescribe empirically a drug because someone else has employed it under certain conditions and claims for it satisfactory results. Some years ago while serving in the capacity of city and county physician under Dr. Ancker, a pharmaceutic agent called my attention to a physician in one of the eastern States, to whom he sold many thousand tablets and pills, but the interesting part of it was that these tablets and pills contained no medicine whatever and yet this physician is said to have a large and lucrative clientele. Forthwith I purchased a variety of placebos and dispensed them promiscuously as specifics for all manner of ailments. I am forced to acknowledge that seemingly as many cures were wrought and as many patients returned for more of the wonder-working but drugless blanks as came for calomel, acetanilid, quinine and ipecac. And I cannot help believing that their effect was less harmful.

The recollection of a few carefully observed sick children whom I treated after the orthodox fashion stands out prominently in my memory, and, I regret to say, some of these were made worse—dangerously worse—from taking the medicine I prescribed. This was particularly true in cases of summer complaint and of capillary bronchitis. Opium in some form was commonly given in both ailments, and nearly every text-book on pediatrics endorsed it. Then it was that I resolved never again to prescribe dangerous or even questionable remedies; that while a less potent drug or inert substance might not help the child get well, I could rest assured that no harm would come from its administration.

Very rarely since then have I been persuaded to break this resolution that I did not have occasion to regret it. Looking at the matter from this standpoint, I am a believer in homeopathy, for this school of medicine has unquestionably helped to teach wise people that nine times out of ten nature heals disease without the aid of pharmaceutic art. In truth, I honestly believe, taking the world over, greater harm has been done children from the giving rather than the withholding of drugs. I would not be understood as advocating nihilism in medicine, though I do not hesitate to express the opinion that after all which has been said, the community is still overdosed. It is certainly a source of encouragement to note that the general trend of thought and work in the art of medicine these days is to ascertain the causes and quarrel less with the effects, and it would seem a still greater good to be able to ward off the former than to remedy the latter. In other words, "An ounce of prevention is as good as a pound of cure."

For such constitutional diseases as anemia, rickets, scrofula, goiter, cretinism, acromegaly, Addison's disease and diabetes, can we rely on drugs alone as exerting much influence in their cure? And for infectious diseases such as tuberculosis, typhoid, scarlatina, measles, mumps, variola, whooping-cough, how much real benefit is derived from the thousand-and-one indicated remedies? We cannot change their course one whit. Is there any specific for meningitis? What drugs have we that avail us in pneumonia or even a common cold? If the alimentary canal was ever benefitted by the exhibition of poisons, and is not poison the chief principle of most remedies, then why can we not cure the gastric fever of childhood?

There is another way of looking at the matter, and a very natural one, too. Many of the diseases we strive to cure are undoubtedly of benefit to the human race by their fatal consequences; such for example, are hydrocephalus, tuberculous peritonitis and similar maladies. These seem to be natural agencies which weed out, as it were, the weaklings of the race before they reach the age of reproduction, and are really not so much diseases as manifestations of congenital incapacity for life. It may be conscientiously asked, Would the race not be ruined if our art could always preserve the individual subject of such maladies? All about us are seen individuals utterly unfitted for the struggle of life who would have benefitted humanity more had they ceased to live and reproduce their kind. We bless the Creator when He takes them away and yet our art demands that we strive to save and prolong their life. The time may come again as in the days of ancient Greece when weaklings will be allowed to perish. Until then we must do all we can for them, but we ought also to know what these diseases mean. If I strain the truth or offend your sense of humanitarianism I cannot but believe that many of you in your practice have considered the advisability—in select cases—in aiding nature snuff out the candle of life rather than prolong its flickering and hopeless misery. To be sure there is a joy in living that even an imbecile may delight in. But a light that shineth only unto itself would not be missed, and its going out would not be regretted.

In reviewing the whole category of children's ailments I am at a loss to discover any recent and decided advances made in their treatment as regards drugs save in the one disease of diphtheria. Within the last four years we have had thousands upon thousands of cases of smallpox in our midst and yet the treatment recommended by Sydenham in the seventeenth century is practically the same as that in vogue today (Osler). The mortality from whooping-cough in New York City is as great as that from typhoid fever. Twenty-five per cent of all cases under a year terminate fatally (Jacobi). And yet pertussis has no fewer than one hundred remedies recommended for its relief. Take a common complaint like enuresis: who of us have succeeded in finding a drug that offers the least hope of effecting a cure? I do not say that by other means this and other ailments are not benefitted and possibly cured, but of what value are drugs in their treatment?

Viewing the proposition from the standpoint of pharmacology and therapeutics let us pick out a few of the better-known drugs and take a look at their virtues.

Aconite, particularly amongst homeopaths, is, I presume, used more frequently than any other one remedy in the treatment of children. The teachings of our therapeutics are that this drug is indicated in febrile conditions depending upon local inflammation, such as tonsilitis, sore throat, etc. Both Holt and Rotch say that tonsillitis is self-limited and in a vast majority of cases is not benefitted by the administration of any drug internally or by local applications.

Of opium there seem to be very pronounced differences of opinion. A distinguished English authority says that opium or its derivatives should not be given to a child under five years of age (Brunton). Personally I consider this a most valuable drug, but one has to have it impressed on his mind very forcibly now and again that it is a remedy which requires the greatest care in its administration. In giving it to children we must think of the dose as compared with that of strychnine or even smaller. In cholera infantum there is excellent authority for giving hypodermically 1-100 grain of morphine with 1-800 grain of atropine every hour until vomiting and purging are arrested (Holt). No doubt many of us could cite instances where the giving of this drug in too large doses has been followed by fatal consequences. I know of two such cases.

Castor oil, calomel, cascara,—what may be claimed for them? The first two are specially recommended in the treatment of gastro-enteric affections, but would better be forgotten as mere purgatives. Cascara will open the bowels, so will a lot of other things. What is the advantage? If the alimentary tract needs to be cleaned out why not wash it out?

Except when their use is special, as in poisoning, heart failure, etc., I would leave strychnine, atropine, nitroglycerine and such alkaloids out of the list of drugs for children.

All authorities are agreed upon a few things regarding digitalis. (1) That it will brace up a rapid, irregular and feeble heart; (2) that it is a good diuretic in cardiac dropsy; (3) that it is specially useful in mitral disease. We must not lose sight of the fact, though, that digitalis is injurious and even dangerous in aortic disease, since by slowing the pulse-rate it lengthens the time during which the blood can regurgitate.

Of such tonic restoratives as arsenic, iron, phosphates, cod liver oil, etc., I have never been able to demonstrate their asserted worth to my entire satisfaction. Proper food, favorable and hygienic surroundings and a sand pile to dig in, hold out more hope for me in the treatment of debilitated children than a whole store full of drugs.

Chloroform, ether and cocaine, for any other use than that of anesthesia, and as such they are miracles, might be dispensed with.

Phenacetin, acetanilid, and many other of the coal-tar products, will doubtless act as antipyretics, but where is the necessity, and if it be necessary will not water reduce the fever just as well? They are known to depress, one more, the other less, the action of the nervous system and the functions of the heart, and even to destroy blood corpuscles (Jacobi).

Specifics in medicine are few. Quinine as an antiperiodic and prophylactic against ague and other intermittent affections, is invaluable. No doubt mercury and potassium iodide work wonders in the treatment of syphilis in all its manifestations. Antitoxine in diphtheria is certainly a God-send, and the closing decade of the nineteenth century will be forever marked in the history of medicine because of its discovery.

The practice of medicine is somewhat like the church—its dogma served our fathers, so why not us? And as a matter of belief I would not disturb the confidence of any, for without faith medicaments lose much of their power to heal. You as well as I know that it is not so much what is done for the sick as how it is done and who does it. So in conclusion, while I do not answer my own question, I have said quite enough to lead you to infer that of themselves and in general I consider drugs of little value in the treatment of children; and what is more, I think the time is not far distant when the little ones' physician will not find it expedient to always prescribe potent remedies for simple ailments, and will be upheld if he sees fit to superintend their illnesses without the administration of drugs at all.

SCHOOL LIFE IN RELATION TO HEALTH

BY DR. J. H. MCCASSY, M.A., M.D.

MEMBER OF THE BOARD OF EDUCATION, DAYTON, OHIO.

The normal state of the normal child from the age of four, five, six or seven years is in school, and the physiological way to begin school is in the kindergarten with its short sessions, idealized natural life, games, plays, marches, modeling in clay, form work, etc., where no text-books are used. Beginning education is like proposing to a girl, it should not be too sudden; children need a great deal of encouragement and often a little pressure in order to keep them at study, because they go to play as naturally as a duck goes to water.

It is more economical for tax payers to support the kindergarten and the industrial schools, and thus teach the rising generation how to be self-supporting than it is to maintain a great army of criminals and defectives. Many people go to prison because they have never learned how to earn an honest living. Kindergarten and manual training schools should be multiplied. Criminals as a rule, are only accustomed to the crudest forms of labor.

The fallacy promulgated by the extremist that children should not, as a rule, enter school until after the age of seven or eight years, needs only to be mentioned to be condemned. This may do very well for children who receive instruction and other educational care at home, but as a rule, children whose education is not begun before the eighth year are liable to great risk. The parents of such children may be "well off," today, but their liability to death or failure in business is very great. The opportunities afforded children for an education while their services are at least valuable in productive industry, should not be neglected. It is the testimony of all successful men that unimproved opportunities for instruction while young fill after years with regrets.

In tender years the child is most inquisitive and the memory

Read before the Ohio State Pediatric Society at Dayton, Ohio, June 1, 1903.

most retentive. Nature has designed the child period for the acquisition of knowledge and the formation of habits. I give it as my experience as a teacher, physician, asylum superintendent and oculist and aurist during a period of eighteen years, that the children who undergo a systematic course of instruction in the public schools show fewer instances of scarred and blind eyes, deaf ears, fractured and deformed limbs, skin diseases and pneumonia than the children who are allowed to run wild or permitted to attend school indifferently. The children that run wild and go in swimming too often or while the water is too cold, contract conjunctivitis and ulcers in their eyeballs, which damage the eyesight. Diving dogs contract ear disease and become deaf, so do diving children or divers in general.

Rheumatism, chorea and pneumonia are contracted by various kinds of exposure. More colds and sickness are contracted during holidays than during the continuous school term. I examined 15,000 in insane asylums and find that where one case of insanity is caused by overstudy, 1,000 cases are caused by ignorance and dissipation. Children who get sick from study usually dissipate and neglect their school work. Among this class of pupils worry is prevalent. Children who work are usually well up in their classes and do not worry. If it is impossible to keep the slow or dull pupils up with their classes they should be permitted to slip back gracefully a cog or so.

The normal condition of the child is in school. There should be pure air, careful attention to heating and lighting, proper position at adjustable desks, frequent periods of rest and play and facilities for washing the hands and face at the conclusion of each recess. Each child should bring or be provided with his own drinking cup and small towel. Even shower baths could be indulged in with great benefit at the recess. Many cases of sore eyes or skin diseases may be prevented by cleanliness. Soap and water are cheaper than medicine. Who will dare to contend that children under a systematic course of training where they receive instructions in the laws of health and physical hygiene and in the laws of good citizenship are not stronger, longer lived and happier than those who run wild.

It is a dangerous thing to interrupt the trend of a child's education. The pupils who continue to attend school until the eleventh or thirteenth year, and drop out for one or two years rarely do much good in study afterwards, because they lose the habit of study.

It is a great fallacy to charge study as a cause of mental derangement. Insanity before the age of sixteen or seventeen is a rarity. You frequently see defectiveness or incorrigibility, but not insanity, before this period, and proper training is the best remedy for defectiveness and incorrigibility. Disease and mortality are less among children under a systematic course of training than those that run wild.

It has been ascertained that mortality is higher among the children that are trained in the kindergarten than among those that begin school late in life. Very young boys or girls stand at the head of their classes in graduating and win the gold medals. The oldest in the class rarely stand first. Those who stand first in the class do not turn out the best always, but as a rule, they turn out better than those that stand last in the class. General Grant was seventeenth in his class at West Point.

I will answer the question—"Why are there more spectacles on the school children than formerly?" The answer is that the eye defects are not any more numerous than formerly, but teachers are better informed and more alert to detect defects in eyesight, hearing and diseases, and apprise parents of these defects. In former years children ran away from school because they could not endure the pain of study with eye defects, but today with properly fitted glasses their delight is in school.

Children deficient in mental capacity and morals should have special training. We will concede that heredity is a great causal factor in defectiveness and disease, but training and environment can overcome a great deal, because were it not for the tendency of the cell to return to a healthy condition our hopes in remedying defects and disease would be in vain.

Almost a century ago several leading countries in Europe required in the elementary grades the study of the dead languages as the leading and paramount study. At least seven years were spent in accomplishing this intellectual feat preparatory to entering the university. This attainment had a culture value only while the utilitarian idea was entirely lost sight of. The moment a person used this knowledge in the professions or to gain a livelihood its value became degraded thereby. Even in the United States until ten years ago the dead languages were absolute requirements for the university degree. Prominent educators maintained that unless a person has a knowledge of the dead languages, he was not educated. But today leading universities like Cornell and Harvard no longer require the dead languages in their collegiate courses.

Our course of study in all our schools has become very practical. Improvements have been added from time to time, at the suggestion of leading experts in education. In the course of study in the grammar grades as well as in the high school course, pupils are required to take the full practical and technical course, because they give no intimation that they intend to drop off at any certain grade. In the majority of cases neither the parent nor the pupil know beforehand of their dropping out, consequently they are held on the full course.

It is wise to stay as long as possible on the general course and specialize later on. The extreme commercialism of the age is very much against gaining a thorough foundation. The National Cash Register Company pays special prices for men specially equipped in one particular line. This one man is expected to do this one thing better than any other man can do it. Special equipment is sought with a view to bring the greatest return to the employer for his investment.

The lessons must be presented in an attractive manner. One boy may be told that unless he studies he will fail to pass; this will incite him to diligent study. If you tell this to a certain girl she will go all to pieces, but if you tell them that if they will study from one to two hours per day out of school hours they will not fail, they will do better. It is better to hold out the reward than to hold the club or penalty over them. Parents can help children and teachers by acquainting the teacher with the habits of the pupil at home. Nervousness in pupils arise largely from predisposition. On these pupils the teacher must smile, not frown. Systematic work and well prepared lessons is the remedy. Consciousness of ability brushes away nervousness. Fear of failure causes nervousness.

The first year in school is important as regards the health because it is the period of primary dentition. Dental decay with pus-formation and septic involvement of the alimentary tract is a cause of anemia. Children naturally suck pus into their stomachs. With bad and neglected teeth, mastication is impossible, and chronic gastro-intestinal catarrh results. Neglect of the teeth results in stomatitis, ulceration and sloughing, periostitis, alveolar abscess, necrosis, tonsillitis, pharyngeal otitis, etc. The diet of children is important. Children as a rule eat too much fried meat and drink too much tea and coffee. A child would fare better not to touch tea or coffee until after the fifteenth year. Boiled meats, vegetables, soups, milk, cocoa, eggs and oatmeal form the most suitable diet for children.

Hearing.—Pains in the ear in a household where there are several children is such a common story that little remedial attention is paid to them. Parents often say that a certain child is subject to earaches for days or weeks, and do nothing but rely upon previous experience, saying the child had it before and got well itself. Less attention is paid to ear trouble because even damaging effects are not noticed as in eye troubles. These cases do need attention, because earaches are the forerunners of deafness. Four-fifths of all affections of the ear originate in diseases of the throat and nose. Those arising from primary inflammation of the ear structures are rare. The two symptoms that the teacher has to deal with are pain and deafness. When ear pain is persistent the nose and throat should be examined. Frequently enlarged and inflamed tonsils will be found and possibly pharyngitis, ulceration, nasal catarrh, adenoids, etc. Children afflicted with impairment of hearing miss a great deal in study, and are often erroneously counted dull.

The coroner of Philadelphia reports that fifty per cent of the deaths among children coming under his notice were due to aural sepsis.

Adenoids, nasal trouble, large tonsils, cause nervousness and constitutional trouble in children, also croup, coryza, bronchitis, middle ear deafness, suppurative otitis media. Nearly all children have more or less of the adenoid tissue, but when this tissue is so abundant as to cause mouth breathing, snoring, running catarrh, dulness of the voice, inattention, forgetfulness, night-terrors, the adenoids and tonsils should be removed.

Myopia.—We are a nation of hard workers. We are a nation of near workers, and of indoor habits. It was claimed that myopia was due to bad hygienic environment of the school-room, and a campaign for improvement in the construction of desks, seats, proper type in school books, lighting, heating and ventilation has been in progress for many years, and re-examination after many years under the improved conditions shows that myopia has decreased. The vertical and half slant writing enables the pupil to sit in a better position at his desk and has been a strong factor in abating myopia.

Under high pressure in schools uncorrected ametropia, such as hypermetropic astigmatism, etc., is followed by myopia. The eyes of pupils should be examined and a mydriatic used in complicated cases during the first school year and again before entering the high school.

The oculist should furnish the pupil with a certificate stating the proper position for him in the school room as regards the blackboard and the admission of light.

Children with marked anatomical defective eyesight should be advised against entering the learned professions, and trades such as tool making and other trades which require great acuity of vision.

Myopia is not an inheritance, but it does occur in conditions of impaired health, bad nutrition and uncorrected errors of refraction. The treatment, properly fitted glasses, should be worn constantly. If there is a constant increase of myopia the student must be taken away from all near work and put on the farm or ranch. The medicines that are useful in bad cases are iodide of potassium, syrup of the iodide of iron and bichloride of mercury.

Hypermetropia.—Rarely is a child born myopic. Rarely does a child become myopic until after the age of seven or eight years. About sixty-five per cent of people tend toward far-sightedness, and only ten per cent toward myopia, leaving only fifteen to twenty-five per cent of eyes exactly normal. Slight degrees of hypermetropia or myopia cause no trouble. But slight degrees of astigmatism left uncorrected cause great annoyance. Pupils with two to four diopters of hypermetropia go on trying to study for years and suffer from headache on attempting near work. It will be noticed that these pupils look about the room in order to rest their eyes from near work. Uncorrected errors of refraction cause pupils to hate study.

In London, England, six oculists were appointed by the Board of Education to examine the eyes of the school children. They found that eighty per cent had good vision, ten per cent fair, and ten per cent bad, and of the latter two or three per cent were very bad. The condition of the eyesight in Dayton and nearly all the Ohio towns and cities is better than in London, England, because there is better opportunity afforded here for long range vision, and more attention is given to physical training than in London, England.

Dr. Ranney, of New York, reports cases of mental failure, epilepsy, chorea, paralysis, deformity, diabetes, neuralgia and nervous prostration cured by correcting glasses and the cutting of eye muscles. Children brought up in the savage state have the most favorable surroundings for physical development, but the state from the standpoint of economy finds it profitable to thoroughly educate her citizens, while close application to school work may be a drain upon the vitality of some children, yet this can be practically overcome by careful attention to the laws of health.

A CASE OF MITRAL STENOSIS

By Francis W. Sinkler, A.B., M.D.,

OF PHILADELPHIA.

This patient, G. H., was sent to the Medical Dispensary of the Episcopal Hospital on May 28, with the request that he be examined and a certificate filled in, stating that he had phthisis, in order that he might be admitted to a home for consumptives near this city.

His condition at that time was as follows:—

An anemic, undersized boy of fourteen, with moderate degree of dyspnea, cyanosis, marked weakness, and frequent cough. His face showed the typical palor and cyanosis of cardiac disease with distinct movement of the alae of the nose, and of the auxiliary muscles of respiration. The respirations were about 26 to the minute and of a thoracic type mainly. The pulse was regular, of small volume and about 100 to the minute. The slightest exertion increased the dyspnea and cyanosis.

His chest, spare and flat, showed slight prominence of the superficial veins with decidedly more bulging of the precordia than of the right side, and an impulse was visible over almost the whole precordia. The heart dulness extended from the second rib above, and from the right mid-clavicular line to the apex, situated in the seventh interspace in the mid-axillary line. The impulse extended from the third rib and the left border of the sternum to the apex, and was heaving in character. A marked double thrill was present over this area.

A loud double murmur was heard over the whole precordia, being loudest over the area of impulse. A softer systolic murmur of lower pitch was audible over the ensiform cartilage and over the liver. No murmur was heard at the aortic cartilage, and the pulmonary second sound was not accentuated. Associated with these signs there were present a systolic pulsation in the cervical veins, and an ill-defined Broadbent's sign.

These signs with immobility of the cardiac dulness gave rise to the suspicion of an old pericarditis accompanying valvular disease. The lungs gave evidence of congestion in the numerous moist rales throughout both lungs, and on the right side a slight effusion posteriorly and in the axilla. At the right apex there was evidence of compression in the prolongation of expiration and slightly higher pitch, while the percussion note was normal over each apex. The liver was enlarged, extending from the fourth rib one inch below the costal margin, and did not pulsate.

There was no ascites and no edema of the lower extremities. He was admitted to the wards of the Hospital on June 1 under the care of Dr. D. L. Edsall through whose courtesy I am allowed to exhibit him.

For his previous mistory I am indebted to the resident Dr. Despard. His parents and three brothers are living and well. Two brothers died in infancy. The patient had measles when three years old and scarlatina at seven. Four years ago his foot was crushed by a railroad accident and amputated at the Episcopal Hospital. Previous to this he had been healthy and as active as other boys, with the exception of a tendency to contract colds after trifling exposure. There is no history of rheumatism or chorea.

He has never seemed entirely well since the operation. In May, 1901, when twelve years old, he had an attack of pneumonia lasting about four weeks. He seemed to make a good recovery, but his physician stated that his heart was not sound, and that his parents could not hope for him to be ever entirely well. Two months after this attack he had what was called a second attack of pneumonia which also lasted four weeks. Since these attacks of pneumonia two years ago he has never been able to lead an active life. He became cyanotic and dyspneic on exertion and was often unable to go to school. He has had a cough which has persisted being, at times, severe, and at others, slight.

On returning to the city after spending last summer in the country, he began to fail, and his condition has steadily grown worse, until he became as described on coming to the Hospital.

In the Hospital, his condition rapidly improved, under rest in bed and the cardiac signs gradually changed.

The cardiac dulness has moved in on the right to within one inch of the right border of the sternum, the impulse has become stronger, and his pulse fuller. The sounds at the apex are now a loud blowing systolic murmur, heard also over the whole precordia. In the 7th interspace, the point of strongest impulse, the systolic murmur is heard while the flapping diastolic sound, heard over the body of the heart, is here replaced by a low-pitched rumbling murmur of long duration. The systolic murmur is conducted loudly over the whole chest. The pulmonary second sound is markedly accentuated while the tricuspid murmur has disappeared. The lungs show fewer rales and although the effusion remains at the right base, it has diminished somewhat in amount.

The pulsation in the veins has very largely disappeared. Broadbent's sign has become very much less distinct, and the thrill has diminished greatly in intensity. The sputum, muco-purulent in character, has been examined several times for tubercle bacilli with negative results, and his urine has been normal at each examination.

The case is regarded as one of mitral stenosis and regurgitation with pulmonary congestion and effusion into the right pleural cavity.

An interesting feature of the case is that signs of a chronic pericarditis were present at first, and seemed likely to be reliable owing to the not-infrequent association of pericarditis and valvular disease in children. The disappearance of these signs and the appearance of more typical signs of the valvular lesion under the rest which has permitted the heart to somewhat regain its tone, are instructive.

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ENDOCARDITIS FOLLOWING DIPHTHERIA*

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It is not very unusual for cardiac murmurs and an increase of heart dulness to appear in the course of an attack of diphtheria. This condition is due, in the great majority of instances, to a weakening of the myocardium and dilatation of the heart chambers with a consequent insufficiency of the mitral valve. More rarely it is caused by a vegetative endocarditis situated usually on the mitral valve, and more uncommonly on the aortic. In the former, rest and time have often been sufficient for the muscle to recover and the symptoms to disappear. In the latter, however, the valve becomes deformed and chronic endocarditis follows. The first cases reported were by John Bridges in 1864. He stated that he had seen 3,000 cases of diphtheria and that in four he had detected "a slight systolic murmur; in two of these, this disappeared in a week; in one, it persisted some months, and one is now under treatment." He said that the condition could be diagnosed by "an anxious countenance, hurried respiration, rapid pulse (120-170), tenderness over the precordial region, but scarcely any pain except on pressure." He saw in twenty-four postmortems "a reddened, roughened, thickened appearance of the valve (mitral), as if by interstitial deposit, situated midway between its insertion around the ventricular opening, and the attachment of the chordæ tendinæ, one or both valves being affected according to the severity of the case and the time elapsing between the symptoms of heart disease and death." The cases with murmurs, which he reports were probably only dilatation except the one in which the murmur persisted; this one was probably a true endocarditis. His pathological findings are very much like those of Labadie-Lagrave and Bouchut in 1872, and which led them to conclude that diphtheria nearly always entails an acute inflammation of the endocardium and particularly the mitral valve. They state in their two memoirs that they found a redness circumscribing the free margins of the valve and mammillated projections, which they regarded as vegetations, on the upper side of the mitral usually and of the tricuspid rarely. Parrot, Sanné and Bourges criticized their work on the grounds that the reddening, thickening and roughening of the valve margins were not the pathological changes of acute endocarditis, but were rather postmortem effects. And Parrot showed that the so-called vegetations are really the products of the fibrinous transformation of the little hematomata developed during the first months of life and possibly in intra-uterine life.

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*Read at the meeting of the Philadelphia Pediatric Society, July 9, 1903.

The most important work that has been done in this connection is that of Councilman, Mallory and Pearce and Hibbard in the cases, which occurred in the South Branch of the Boston City Hospital. Hibbard examined the heart complications in 800 consecutive cases and found seventy, or about nine per cent, of these had an irregularity of the pulse, and about half of these had some other heart symptoms; the irregularity often occurred several days before a murmur was heard. All of the murmurs were systolic and about half of them were heard loudest at the apex, and half loudest at the base. A systolic murmur was heard in 57 out of 800 cases, and in 28 out of 252 cases in another series, a total of 85 in 1,052, or eight per cent. That is, according to his report, we can look for a systolic murmur, accentuated second sound and an increase of heart dulness in about eight per cent of all cases of diphtheria. In fifteen of these cases which were watched five to fifteen weeks, the murmur was still present at the time of discharge. These may safely be presumed to have been true endocarditis. In another one, however, the murmur disappeared at the eighth week. Of seven cases with murmur which died, only one showed any vegetations, and these were upon the aortic valve; in another one some specks were seen upon the endocardium. In the examination by Councilman, Mallory and Pearce, of 220 fatal cases of diphtheria from the same hospital, seven cases of endocarditis were found. In one of these a pure culture of the Klebs-Loeffler bacillus was obtained from the vegetations, which were on the mitral valve. This makes the third case reported in which the bacillus was found, the other two having been reported by Wright and Howard. In the cases of Wright and Howard, while the bacillus was morphologically identical with the Klebs-Loeffler, it was found not to be toxic. The history of my case is as follows:—

Anna W., aged six years, a small blonde child rather delicately constituted. She has not had rheumatism nor tonsilitis; she has had influenza, chicken pox and bronchitis. The attack of diphtheria was one of moderate severity, the tonsils alone being involved. At the beginning of the attack the temperature was 100 and the pulse 100 per minute, small, weak, of low tension and regular; the face was pale and somewhat anxious. The heart sounds were weak, but clearly defined; the lungs were normal. She was given 1,000 units of antitoxin and a smear culture sent to the city bacteriological laboratory. This culture showed the Klebs-Loeffler bacillus in abundance. Twenty-four hours after the antitoxin was given the membrane disappeared and the tonsils were clear. The child was weak and more prostrated than the extent of local involvement seemed to warrant. Her treatment now consisted of whiskey and strychnine internally and a fifty per cent solution of peroxide of hydrogen to the tonsils, pharynx and nares. On the fourteenth day a clear culture was obtained, the throat having been swabbed for the three days preceding with a sixty grain solution of nitrate of silver. The heart was still weak and at times irregular, but the sounds were clear. She was still kept in bed. On the seventeenth day she was found to have a temperature of 101, a pulse of 120, which was intermittent and very weak; at the apex there was a soft systolic murmur which was transmitted a short distance toward the axilla; the pulmonic sound was sharply accentuated and the apex was displaced a little to the left. The fever lasted but three days and each day the murmur became louder and harsher. The area of heart dulness was increased a little to the left. A year later the following is her condition: The apex beat is in the 4th interspace mid-clavicular line, it is fairly strong and over it is felt a systolic thrill. The area of cardiac dulness is the lower border of the 2d rib, just outside the nipple, and the middle of the sternum. At the apex there is a loud, harsh, high-pitched systolic murmur, which may be heard over the whole of the precordia; it can be heard in the axilla in fair volume and faintly at the angle of the scapula; no murmur is heard at the xiphoid. The second sound is sharply accentuated in the pulmonic area. The heart action is regular and the pulse is 84 to the minute. There is no cyanosis, dyspnea or edema. The urine is normal.

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PRACTICAL NOTE ON THE DIAGNOSIS OF INFANTILE ECLAMPSIA

By John Zahorsky, of St. Louis.

In daily communication with practicing physicians I have gleaned the impression that peripheral irritation is generally regarded as the principal etiological factor in the convulsions of infants and children. Of these irritants adherent prepuce and some indigestible substance in the gastro-intestinal tract are usually regarded as the most common. It follows that the practitioner in most cases will order a purgative and forcibly retract the foreskin. I am convinced that this aspect of ordinary eclampsia is misleading, does not encourage further diagnosis or is entirely erroneous.

It is rare indeed that peripheral irritant will cause convulsions without a heightened irritability of the nervous system. The most important diagnostic inquiry then is not the peripheral irritant, but what is the condition inducing the heightened irritability and what are the etiological factors back of it. It is sufficient to remember three states of causing the heightened irritability, viz., high fever, malnutrition, and disease of the brain.

My method of procedure is as follows:

Having subdued the most violent convulsive movements by appropriate treatment (chloroform, bath, etc.) I take the rectal temperature.

In the vast majority of cases high fever (103-109° F.) will be found to be present. It is the fever or the toxemia that induces the fever that gives origin to the heightened nervous irritability. Having established the presence of fever, the clinician must determine the cause of the fever. Excluding thermic fever and the elevation of temperature which accompanies grave injuries to the brain, we regard the fever as a symptom of an infectious disease and by other symptoms and signs its location and nature must be determined.

When very little or no elevation of temperature is present, we must look for malnutrition. The child has been fed on proprietary foods, condensed milk, sterilized milk and shows evident signs of rickets.

I will not enter here into a discussion of the differential diagnosis of general tonic and clonic spasms in rickets and infantile tetany. Suffice it to say that the border line is not clear and we are compelled to regard all tonic and clonic spasms due to rickets and malnutrition as being allied to tetany. As a clinical aid, too, it is convenient to have a distinct name for the convulsions due to infectious diseases and cerebral diseases and those due to rickets. For the treatment of the first variety is a reduction of the temperature and the combatting of the infectious process; in the latter variety, an antispasmodic with proper dietary measure is effective only.

It is absolutely necessary that the practitioner sharply distinguishes between the great irritability of the nervous system due to high fever and that caused by faulty nutrition. This is more important than the discovery of a peripheral irritant.

Finally, a toxic, circulatory, organic, or functional disease of the brain or meninges must be considered in the diagnosis of infantile convulsions. This is made in the interval of the convulsions by the presence of marked cerebral symptoms, and examination of the urine, etc.

In conclusion I hereby give some of the diagnosis of cases of convulsions which have come under my observation in the last few years.

I. Cases associated with high fever.

Thermic fever 2; malaria 3; meningitis 4; influenza 5; scarlet fever 1; gastro-enteric infection 3; tonsilitis 2.

II. Cases associated with little or no fever.

Rickets 8; epilepsy 2; cerebral syphilis 1; brain tumor 1; hydrocephalus 1.

It will be seen that the peripheral irritation does not seem very prominent in these figures. Of course, I do not mean that these irritations should not be sought, but the first question to answer is —What induces the increased irritability?

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II. Cases associated with little or no fever.

SOCIETY PROCEEDINGS

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN

Meeting held May 15, at 11 Chandos Street, W.

Dr. Frederick Taylor in the Chair.

Colloid Carcinoma.—Dr. Porter Parkinson showed a specimen of colloid cancer of the peritoneum removed from a child aged twelve years. During life the abdomen was distended with free fluid, and she was thought to be suffering from tuberculous peritonitis. On removel of the fluid large cells filled with colloid deposit were found in the detritus. An irregular, hard swelling was then palpable in the hepatic area, and some scattered nodules elsewhere could be felt. An abdominal section was subsequently made and the peritoneum was found to be sewn with small masses of growth of a sodden semi-transparent appearance, which microscopically were colloid cancer. Subsequently the abdomen became completely filled with irregular masses of growth which surrounded all the contained organs.

Dr. Theodore Fisher (Bristol) said the majority of cases of peritoneal cancer were secondary to disease somewhere else in the alimentary canal, and it was in his experience often very difficult to find the primary source. Dr. A. E. Benson thought by reason of its early age the case was probably a record, and it raised the question as to the value of a miscroscopical examination of the ascitic fluid for diagnostic purposes. Dr. Parkinson, in reply, said the primary seat of the growth was thought to have been in the rectum. He thought the detection of cells by the microscope such as he had described might possibly prove of assistance in diagnosis.

Interstitial Keratitis.—Dr. A. A. H. Partridge (introduced) showed a boy aged ten and a half years the subject of interstitial keratitis who simultaneously developed an affection of the hands. The question as to the precise condition to which the joint changes were due was an interesting one. The joints looked to most people like those of osteo-arthritis, but he supposed they must be considered due to the general condition. An interesting point about the case was that the left hand became affected after the left eye and the right later on—this happened in November,

1901. The right eye failed in January, 1903. Dr. Edmund Cautley said it did not seem to him to be a syphilitic affection of the joints; he was much more inclined to consider it a case of osteo-arthritis arising in a child the subject of inherited syphilis. The condition of the joints was so comparable to what was found in that condition that he saw no reason to suppose that it was syphilitic. Dr. G. A. Sunderland was opposed to Dr. Cautley's views. He admitted the appearance was very like that of osteo-arthritis; nevertheless, seeing that the child was syphilitic, and knowing that that disorder comprised many manifestations which would simulate almost any known form of disease, he thought that the joint changes were probably syphilitic in origin. The important test in that connection was the result from treatment, though the want of success from treatment was not always a criterion. Dr. George Carpenter agreed as to the striking resemblance between the child's condition and osteo-arthritis. He thought there was periosteal thickening of the heads of the metacarpal bones and that the condition of the knuckles could not be distinguished from syphilitic epiphysitis. He thought one or two of the metacarpo-phalangeal joints displayed gummatous synovitis, and it had apparently escaped notice that the carpus on both sides was also involved. He thought the type the disease had assumed was very unusual, but he was in favor of its syphilitic nature. He hoped some X-ray photographs would be taken, as they might throw some light on the structures involved, and that the child would be again shown to the Society after a topical and medicinal antisyphilitic course. Dr. F. Parkes Weber said he had examined the case very carefully with Dr. Carpenter, and the evidence was very strong in favor of its being a symptom of congenital syphilis. Unlike osteo-arthritis, there was a complete absence of tenderness, and the movement in the joints was almost perfect. The changes were almost entirely confined to the bones and the periosteum. Certainly there was just the slightest effusion into one or two of the joints. He regarded the case as one of phalangitis, of syphilitic origin. A Continental observer had pointed out that one of the diagnostic signs, where the metacarpal bones as well as the phalanges were affected, was that the swelling occurred chiefly at the distal ends of the metacarpal bones, i.e., in the neighborhood of the epiphyses. This diagnostic feature was strongly marked in the present case. Dr. Frederick Taylor said he was interested in the discussion, and related the case of a child with swelling of the knees where a difficulty arose as to the nature of the affection as between osteo-arthritis and syphilis. She had a hard lump on one parietal bone, and her mother had suffered from syphilitic necrosis of one of the cranial bones. She had not the appearance of a syphilitic child.

Dr. Partridge, in reply, did not consider the ends of the bones were enlarged, but he thought the tissues round the joints were thickened. He did not see how any plain distinction could be drawn between osteo-arthritis and syphilis, except that the child was syphilitic.

AUTOPSY DIPHTHERIA.—Dr. Edmund Cautley showed the stomach and esophagus of an infant aged eighteen months who had died from diphtheria. The child was admitted for constipation and anuria, and ten days later developed bacilluria, the variety being the bacillus coli. Subsequently it became feverish, profoundly asthenic, and died in twelve days from the onset of the fever. The esophagus contained membrane in the upper third. One third of the mucous membrane of the stomach towards the pyloric end was covered with yellowish-grey membrane. Dr. Theodore Fisher said that if bacilli were examined for in the urine they would be found more often, and he drew attention to the large number of cases of pyelitis that were overlooked in the post-mortem room. If the pus from such were examined microscopically the micro-organisms of the associated disease would be found in it. Dr. Watson (introduced) said he had obtained a pure culture of the Klebs-Lœffler bacillus from the mucous membrane of the stomach, and also in sections of the stomach wall.

Dr. J. Porter Parkinson showed a case of enlarged bronchial glands in a child aged four and a half years which was associated with a paroxysmal cough like whooping cough. The associated signs were those of bronchitis, with weaker breath sounds on the right side and in places somewhat bronchial in quality. There was much sputum, which was free from tubercle bacilli. The fingers and toes were clubbed. He thought there were enlarged mediastinal glands pressing on the right bronchus with secondary dilatation of the tubes, and that the "whoop" was occasioned by irritation of the vagus nerve. Dr. Frederick Taylor said his clinical experience had considerably modified the ideas which had been impressed upon him years ago as to to the supposed frequency of enlarged bronchial glands, which he now looked upon as quite a rarity. Dr. G. A. Sutherland said the evidence of enlarged glands was not very striking to those who saw the child for the first time. The physical signs in the right lung were quite sufficient to account for the condition. He would be inclined, perhaps in a spirit of contradiction, to take the opposite view and to look upon the changes in the lung as primary. Dr. Parkinson would find it equally difficult to disprove that contention. Dr. Parkinson, in reply, was doubtful whether the bronchiestasis alone was sufficient to explain the very continuous whoop. It was so distinct that the child was not allowed by its mother's friends to associate with their children, and it was sent out of hospital on several occasions as a case of whooping cough.

ATHETOSIS.—Dr. Frederick Taylor showed a case of athetosis in a child with mitral disease. The girl was suddenly attacked with right-sided hemiplegia during sleep, and some twitchings of the right arm and leg were noticed at the onset. Involuntary movements commenced in the right hand and foot two days after the hemiplegia began. Dr. A. E. Sanson said there was no question as to the embolic plugging of the left middle cerebral artery. Plugging in a purely rheumatic case of heart disease was not quite so common as people thought. Dr. Edmund Cautley asked if it were a common experience for athetosis to develop so quickly after hemiplegia. Dr. G. A. Sutherland said Dr. Taylor's first impression was that he, Dr. Taylor, was not quite sure whether it was athetosis or chorea, and his own impression was that it was a case of chorea from the nature of the movements. It seemed to him that the movements were very rapid for athetosis, and there was also the fact of the rapidity of their onset, and there was the association of endocarditis, which was a strong point in favor of chorea, and he did not think the absence of facial movements absolutely excluded chorea. He also asked whether there had been any rigidity or spasticity. Dr. George Carpenter related a case where athetosis involved both sides in sequence to meningitis, and the movements on the right side were so violent that the arm had to be strapped to the side. First one side of the body was attacked by paralysis, and then the other, but the choreiform movements were not so distinctive a feature on the left side as on the right. The illness was very chronic and progressive, but the child, who became subject to epileptic attacks, lived for about ten years.

Dr. Frederick Taylor, in reply, said such an early onset was very uncommon. The difference in rapidity of the movements observed in various cases went for very little, and to illustrate that he called attention to a man sometimes to be encountered in the streets of London who had a "mad" arm, the movements of which were sometimes so violent that it had to be strapped to his side. Chorea itself was sometimes "fast" and sometimes "slow." In regard to spasticity he would not expect to find that, as he thought it was not present in athetosis; it was replaced by abnormal mobility. His opinion was that it was embolic and permanent, but that if it were choreic, as Dr. Sutherland thought, its recovery might naturally be expected in two or three months.

Dr. Frederick Taylor showed a case of acute anterior poliomyelitis involving the abdominal muscles as well as the legs and lumbar muscles. Mr. A. H. Tubby was interested in the question of the exact influence of the abdominal muscles in relation to the maintenance of the equilibrium. He had been looking for a case of paralysis of the abdominal muscles alone, but so far he had not found it. Dr. Theodore Fisher drew attention to a case of his own, one of paralysis of the abdominal muscles where the belly wall "ballooned" on one side in sequence to respiratory movements, and in which case the anterior cornua appeared to the naked eye to be involved. Dr. G. A. Sutherland asked Mr. Tubby if he had any theory as to why the trunk muscles escaped and why they were so rarely involved. Mr. Tubby, in reply, said the more he saw of cases of infantile paralysis the more he found these muscles were involved, and he thought the lesions were as much primary there as in the limbs. Dr. Taylor said he was not surprised at Mr. Tubby's answer, he was going to suggest the same thing. Probably the abdominal muscles escaped examination along with the limbs. In regard to Dr. Fisher's case he assumed that in order to obtain bulging there must be a considerable portion of the muscles intact and a limited portion affected.

INFANTILISM.—Dr. E. C. Williams (Bristol) read a paper upon a case of infantilism in a child aged ten years who had not grown since four years old. Her weight was twenty-six pounds and her height three feet. She was awkward to manage and rather dirty in her habits. She could read her letters and count and answer simple questions fairly intelligently. There was no heart disease; she was free from congenital syphilis and rickets, and she had lost weight under thyroid treatment. Dr. G. A. Sutherland asked whether there were any anatomical defects, and drew attention to a case he had recently brought to the notice of the Society. Dr. George Carpenter drew attention to the association of infantilism in congenital syphilis with atrophied testicles. He suggested that Dr. Williams should make a rectal and bimanal exploration of the pelvic viscera and report upon the condition of the uterus and the fallopian tubes and ovaries, as it would make the case more complete if that were done.

Dr. John McCaw (Belfast) read a paper on a case of splenic leukemia in a child aged eighteen months. There was no history of syphilis and she was not rickety. The accessible lymphatic glands were enlarged. The spleen reached to the umbilicus and the liver also. The urine was loaded with oxalates and contained a trace of albumin. There was intense leucocytosis—the lymphocytes reached 99.8 per cent of the leucocyte count. The red corpuscles were diminished by more than half, and a few nucleated corpuscles were seen. The hemoglobin was 39 per cent. She subsequently developed purpura and died soon afterwards. The spleen diminished in size very considerably before death and was not nearly so hard to the feel. The swelling of the lymphatic glands disappeared to a large extent, and they were not so hard.

PHILADELPHIA PEDIATRIC SOCIETY.

A stated meeting of the Philadelphia Pediatric Society was held on Tuesday evening, May 12, 1903, with the Vice President, Dr. John H. Jopson in the Chair.

Rachitis.—Dr. A. A. Eshner exhibited a case of probable rachitic deformity and a case of imbecility, the two patients being sisters. In the family history it was noted that the father had been treated for many years for some cutaneous disorder affecting the face. One patient, who was eight years old, had been born at term, without difficulty; had been breast fed, and had walked and talked normally. There had never been a convulsion. At the age of five and a half years nodosities began to appear on the hands. They steadily increased in size, but there was no alteration in muscular vigor. The proximal phalanges of the four fingers of the right hand, as well as the metacarpal bones of the index and middle fingers and the proximal phalanges of the index and little fingers, and also the metacarpal bone of the left hand, exhibited somewhat bulbous enlargement, with apparently slight bending. These deformities were well shown in the skiagraphs kindly made by Dr. R. S. Lavenson. The legs were not bowed, but the forehead was bulging and prominent, and the incisor teeth were in part slightly notched. Potassium was prescribed in doses of from three to five grains thrice daily, but on the development of symptoms of iodism, syrup of hypophosphites, one fluid dram thrice daily, was substituted, together with beef juice and orange juice; and the patient made a steady, if slow, improvement.

The second patient was fourteen years old. She also had been born at term without instrumental aid, after an easy labor. She had been breast fed and had been nursed for seventeen months. She was not able to stand until she was two years old, and she did not walk until later. She was five years of age before she could speak, and her speech had never been quite clear, although she comprehended perfectly. She had never attended school and was unable to learn from books. She had had the chicken-pox, whooping-cough and scarlet fever. For several weeks she had been cross and irritable. For a time she had complained of headache, but this had grown less marked. She presented a prominent head, with a large lower jaw and full cheeks. Her expression was cretinoid, the lips being thick and held apart; the tongue, likewise, being thick, and kept much of the time between the teeth. The hair on the head was shorter and thinner than that of other girls in the family. The skin was dry and rough. The thyroid appeared rather full. The pulse was rapid, 120 in the minute; the heart was free from murmur. The knee-jerks were slightly exaggerated. Under treatment with thyroid extract the child became brighter and less irritable, the hair grew thicker, and the skin became less rough in places than it had been.

While each of these cases is interesting on its own account, their particular interest lies in the possible possession of a common etiologic factor; namely, the inherited syphilis. It seems not impossible that this disease might give rise to nutritional disturbances, resulting, in the one instance, in the cretinoid condition, and, in the other, in the disorder of the bones.

Dr. John H. Jopson, discussing Dr. Eshner's case, said that the elder of the two sisters certainly exhibits some of the characteristics of cretinism, and that the younger very strongly suggests the presence of a specific infection. There is decided notching of the central incisors in the upper jaw, and the thickening of the phalangeal bones is quite suggestive of a pre-existing dactylitis. The involvement of the hands alone and the characteristic shape of the phalanges, associated with the notching of the incisors, are, in Dr. Jopson's opinion, strong evidences of specific infection, and the family history is also very suggestive of this.

ECTOPIC TESTICLE.—Dr. John H. Gibbon presented a child a year and a half old, upon whom he had operated for a perineal ectopic testicle. The case was sent as one of possible perineal hernia; an examination, however, showed the left scrotum empty, and the left testicle freely movable in the perineum. It could be pushed up nearly as high as the external ring, and back nearly as far as the anus. An incision was made from the external ring downward into the perineum, until the tunica vaginalis was reached. This was separated entirely from the surrounding structures as high as the external ring. As the sac extended high up on the cord, the upper portion of it was dissected free and removed. The posterior wall of the left scrotum was then divided through the same incision, a place was made for the testicle, and the organ entered its place. The operation had been done five or six weeks previously, and the wound had healed by first intention. The testicle has remained in the new position, and is freely movable in its tunic.

This form of ectopic testicle is extremely rare, and is frequently associated with a form of hernia that Coley has well named "inguinoperineal." He states that he has met with this condition in six instances. This form of hernia is well named, because the testicle passes through the inguinal canal, out of the external ring; and, instead of passing into the scrotum, goes directly downward into the perineum; and the hernia follows it. The testicle in the case reported by Dr. Gibbon was small, but, because of the age of the child, it had been thought wise to preserve it.

Dr. Hammond, discussing Dr. Gibbon's patient, said that he considered the case extremely interesting as well as rare. He thought that the favorable results obtained show what an advance there has been in surgery during the last decade. In 1870, Mr. Adams reported in the London *Lancet* a case operated upon by Mr. Humphreys, in which the patient died, on the third day, of peritonitis due to extension of the infection through the funicular process—which was, of course, not closed. Professor Annandale reported another case, in which a successful operation was performed to restore the ectopic testicle by making an incision over the front of the scrotum, from the external ring, half-way down the scrotum, and exposing the cord, by means of which the testicle was drawn out from its abnormal position. In this way the cord and the testicle were brought into correct position, and the testicle was fastened there by means of catgut sutures passed through it.

While, said Dr. Hammond, Dr. Gibbon has obtained a beautiful result, it is possible that the testicle is still out of the normal position. The speaker believed that had the incision in this instance been made over the dorsum of the scrotum, as indicated, the testicle would have been more likely to remain in its proper position.

PERITONITIS AND OBSTRUCTION.—Dr. Gibbon read a paper on "Obstruction of the Bowels and Peritonitis, Due to a Strangulated Merkel's Diverticulum." and reported a case. The patient was a girl, ten years of age, who had been admitted to the Pennsylvania Hospital suffering with a general peritonitis, accompanied with vomiting and marked distension of the abdomen. This was supposed to be due to appendicitis. Immediate operation was performed, the incision being made in the right semilunaris. The peritoneal cavity was found to be filled with a quantity of seropurulent exudate, and a mass of partly adherent intestine was found in the right iliac region. The small intestine was enormously distended. After separating the adhesion, a Meckel's diverticulum was observed. This was covered with plastic lymph and very much inflamed. A fibrous band passed from its extremity in the direction of the umbilicus, and this was broken before its distal attachment had been discovered. When the band was divided, the diverticulum, with the bowel to which it was attached, was easily withdrawn from the abdominal wound. It arose from the ileum, about two feet from the cecum, directly opposite the mesenteric attachment of the bowel. The portion of the bowel to which it was attached had been constricted by the diverticulum to such an extent that there was a distinct white ring extending over about half the circumference of the bowel—such a ring as is frequently seen in strangulated hernia. The diverticulum, therefore, was not only strangulated, but was producing an obstruction of the bowels. The diverticulum measured about two inches in length, and was of the same caliber as the bowel to which it was attached. It was removed, and the opening in the bowel was closed. During the process of separating the adhesions, a tear had been made in the ileum near the diverticulum, and this also was closed. The entire small intestine was removed from the abdominal cavity, which was thoroughly irrigated with salt solution. A gauze-drain was passed down to the bottom of the pelvic cavity, and another was placed about the sutured intestine, being left directly under the wound. Except for some reaccumulation of pus in the pelvic cavity, due to imperfect drainage on the ninth day—from which the patient readily recovered after improvement in the drainage—the convalescence was uninterrupted.

Dr. Gibbon referred to the literature of the subject, and to the various pathological conditions that might be produced by either the attached or the unattached Meckel's diverticulum. The diagnosis of obstruction due to Meckel's diverticulum is next to impossible; although the two symptoms of visible peristalsis and localized meteorism, together with a history of previous attacks of partial obstruction, are supposed to be indicative. The condition has most frequently been confused with acute appendicitis. Halstead has found the mortality of the cases operated upon for obstruction to be 68.1 per cent. Dr. Gibbon laid great stress upon the importance of not administering laxatives in any form of acute mechanical obstruction of the bowels. The patients, if they are not to be operated upon, will stand a much better chance of recovering if nothing is administered by the mouth and all the food is given by the rectum. The more one sees of obstruction of the bowels the more ready is one to resort to the early operative removal of the cause.

Dr. Bernd, discussing Dr. Gibbon's case, said he had had occasion to see a child that at birth had had an umbilical hernia. On examination it was found that there was a diverticulum which, on first sight, looked like the appendix. This diverticulum had also been mistaken for the appendix by another physician. The appendix was, however, discovered lower down, and the diverticulum was amputated. The child made a good recovery.

Dr. Jopson said that the patient exhibited by him to the Society several years previously, to whom Dr. Gibbon had referred, was an infant with a fecal fistula at the umbilicus. The probe entered this fistula for a distance of an inch or two. It was evidently an instance of the complete persistence of the omphalomesenteric duct. Dr. Jopson, when presenting that patient, had called the attention of the Society to the added danger in the case, in which, in addition to the usual danger attending Meckel's diverticulum, there was that of a prolapse of the ileum through the diverticulum, causing an obstruction that usually has a fatal result.

Mitral Obstruction.—Dr. Augustus A. Eshner exhibited a patient with mitral obstruction. She was a girl sixteen years old, and said that she had been sick for ten years. She complained of cough with dark-colored expectoration, and on one occasion she had had hemoptysis. She also complained of precordial pain and backache. She exhibited slight choreiform movement of the right upper extremity. The chest was somewhat pigeon-breasted in shape. The cardiac apex-beat was extensive, and was visible in the left sixth interspace, within the nipple line. Pulsation synchronous with that of the heart was visible in the left fifth interspace, within the nipple line, in the parasternal line, and also in the epigastrium. On palpation, a distinct, marked presystolic thrill could be felt. The area of cardiac dulness extended from the left sternal border to half an inch outside the left nipple line, and from the left fourth interspace to the costal margin. At the apex, and to the left, a presystolic murmur was audible, followed by a systolic shock; the site of maximum intensity being at the seventh rib in the anterior axillary line. The pulmonary resonance was preserved, but many moist rales were present on both sides of the chest. Vocal resonance was not increased. The sputum had not yet been examined for tubercle bacilli. There were slight left scoliosis and moderate kyphosis in the dorsal region, and the right shoulder was a little lower than the left. The urine had been found to contain albumin, but a microscopic examination had not yet been made. The patient gave a history of having had diphtheria twice, whooping cough and measles in infancy, and "nervousness" for ten years.

Chorea.—Dr. C. F. Judson reported a severe case of chorea, complicated with pneumonia, in a girl of thirteen years. This was the third attack within four years. The disease ran a febrile course for seven weeks, complicated with endocarditis, pleurisy and pneumonia, and marked toxemia from the prolonged course of the infection. In the fourth week the physical signs of pneumonia were present over the lower lobe of the left lung. The upper lobe of the left lung and the lower lobe of the right were successively attacked. Pleuritic friction was heard over the affected areas.

Arsenic could not be given on account of the severe enteritis present. Antirheumatic treatment was of decided benefit in abridging the severity of the disease. When the child left the hospital she had a well-compensated lesion of the mitral valve (regurgitation). The case is of value because it supports the view that chorea is an infectious disease.

POISONING BY WINTERGREEN OIL.—Dr. E. M. L'Engle read a report by himself and Dr. J. Woods Price of a fatal case of oil of gaultheria poisoning in a child of two years. The child, a girl, took, on April 18, 1903, one dram of oil of gaultheria (oil of birch), one hour before being brought to the hospital. She vomited before arriving there. Temperature, 98 2-5; pulse, 100; respirations, 26, and regular. Two hours later the patient complained of abdominal pain, great thirst, and drowsiness. Pulse, 150. One hour later there were flushing of the face, labored respiration, impaired hearing, and hallucinations of vision, diarrhea, delirium, and slight twitchings of the muscles of the neck and hands. There were general convulsions seven hours after the ingestion of the poison. These symptoms increased until death occurred, ten hours after the ingestion of the drug, from respiratory failure.

Dr. Price said that in looking over the records of cases of poisoning with oil of gaultheria that had occurred previous to 1901, Dr. L'Engle and himself had found ten cases, the patients in two of which had recovered. All ten had presented very much the same symptoms as were found in their case, and death had usually occurred within twenty-four hours, although some of the patients had lived for forty-eight hours. The dose had varied from two drams to half a pint.

APHASIA.—Dr. R. S. McCombs read a report of three cases of aphasia which had occurred in the practice of Dr. J. Madison Taylor, who had placed the notes at Dr. McCombs' disposal.

Aphasia, the motor form especially, is comparatively rare in childhood, although not extremely so, and is more frequently seen when the resistance has been lowered by some infectious process. In the first two cases reported there was great similarity in the early phenomena, the aphasia having appeared after generalized convulsions and other symptoms of cerebral hemorrhage. The patients, children aged twenty-two and seventeen months, respectively, had previously been healthy. In both, the faculty of speech, while not having been long established, was fairly well possessed —about as well as could be expected in children of their age. There were other children in the family of each patient, and these were perfectly healthy. It was impossible to elicit any evidence of syphilis or of any underlying cachexia. In the first case, the recovery was complete, except for the local phenomena, the function of speech not having been restored, and a certain amount of paralysis of the right side of the face having still remained; in the second, the aphasia entirely disappeared, and the child now appears to be in excellent general health.

In the third case, the child, aged three years, had never spoken. There were evidences of hereditary syphilis in certain characteristic stigmata that the child possessed, a history of "still-born" children in the family, and the symptoms of a chronic meningitis in the child. Specific treatment was given the child. After one month the symptoms of meningitis had disappeared, the general condition had greatly improved, and there was an effort at spontaneous speech, the child being able to say, "Mamma." At the present time Dr. McCombs thinks it is impossible to state positively that this case comes under the head of heredity syphilis, as the time has been too short to test this thoroughly. The paper closed with a short discussion of aphasia in childhood.

In discussing this paper Dr. Jopson said that the results of the therapeutic test in the last case were so striking that one would be strongly tempted to make a diagnosis on this ground alone. The improvement under anti-specific treatment was very marked, he thought. Time alone can tell whether the improvement will be permanent, and will be followed by the development of the power of speech.

EDITORIAL

DYSENTERY IN NEW YORK

The development of our knowledge concerning the causes of dysentery in children and its epidemic occurrence as a summer complaint is fast arriving at both a satisfactory and a hopeful stage. The verification by numerous students of the observations of Shiga has placed the bacillus called after him on an apparently permanent footing, and the recent observations of Flexner, Duval and Bassett, Park, Harris, and Hiss, all tend to show that there is a group of organisms closely allied if not identical with the bacillus of Shiga.

Dr. Martha Wollstein has just published (*Journal Medical Research,* August, 1903) a systematic bacteriological study of the stools in the cases of a hundred and fourteen infants and young children which were begun in October, 1902, with a view of determining the presence or absence of the *Bacillus dysenteriae* in all cases of diarrhea and with the further object of ascertaining if possible any special group of clinical symptoms characteristic of the cases in which the organism is found.

Through the courtesy of the Medical Board of New York Foundling Asylum, the cases were placed at the disposal of Rockefeller Institute, and throughout the winter, systematic investigations were carried on looking forward to the establishment of the identity of winter dysenteries with the more frequent summer complaint of our hot weather. In all, one hundred and fourteen cases were studied by Dr. Wollstein, occurring in the New York Foundling Asylum, Nursery and Child's Hospital, the Baby's Hospital and the Foundling Asylum, the technic being that of Dr. Flexner.

Of the 114 cases studied the dysentery bacillus as determined by cultural reactions as well as by the agglutination test, was found in 39, or 34 per cent. Of these 27 were only one year of age, 9 under six months, 8 were between one and two years and 4 over two, and of these positive cases 29 out of the 39 died.

It is interesting to note concerning the character of the illness that there was blood in the stools of twenty patients. This was usually in small spots in the mucus or streaking the mucus in nearly every stool. In three cases fluid blood was present, and many stools consisted entirely of blood and mucus. In every case mucus was passed usually in very large amounts. Curds and undigested food were also frequent. In uncomplicated cases the stools varied from 2 to 9 in 24 hours, and were in most cases green in color. In uncomplicated cases the temperature ranged from 98 to 103° F. Fatal cases ran their course in from three days to six weeks, by far the greater number dying early in the second week.

The bacillus that was isolated corresponded very closely to that already described by Shiga. As for the agglutination tests these were fairly uniform. All of them reacted to one of the serums in dilutions of from 1 to 50 to 1 in 3,000.

The author, in summing up, says that cases of infection with dysentery bacillus in infants tend toward the clinical picture of dysentery with frequent mucus and bloody stools.

In some cases of hospital infection, occurring as terminal to other disease (especially pneumonia), and in other mild cases, the stools may never contain blood, but mucus is present in every case and usually in large amounts.

The serum reaction is uncertain during the first week, frequently positive after the sixth day, but may be absent for two weeks. It cannot be relied upon for early diagnostic purposes in infants and young children.

The isolation of the *Bacillus dysenteriae* is the only positive evidence of infection during life. The bacilli are present in the stools for a period of two or three weeks, but may remain for a longer time.

The type of the organism almost invariably found in these researches in New York city is that of the "Manila" or Flexner bacillus.

TEETHING AND FEVER.

THERE is no more homely subject for consideration than that of teething in infancy, and, we fear, there is no question in pediatrics that is in more need of careful and systematic reinvestigation than this. The newer work by Pavloff on the nervous influences that control the intestinal canal has brought out so many important facts concerning the relation of one portion of the intestinal tract to another that much of our pseudo-knowledge is in need of revision and correllation.

Dr. E. R. Corson (*New York Medical Journal,* July 25, 1903) has given a very short, though timely contribution to the "Fever of Dentition" that is worthy of slight comment. He speaks of some early experiences in which death followed lancing of the gums, and of his mistake in assuming that swollen gums were the chief source of troubles that were of a much more serious and involved nature.

So far as the mouth alone is concerned, he says, a very large majority of the cases of dentition, no matter how much swollen or how painful the gums may be, are simply cases of physiological congestion of the parts involved, and if fever is present we must look elsewhere for its cause.

Uncomplicated cases of dentition the physician rarely sees; it is only when fever attends dentition that the family attendant is consulted.

The commonest disturbances associated with dentition are those of gastric or gastro-intestinal irritation. These show themselves by constipation, or more often by diarrhea, nausea, vomiting and various pains and, most important of all, by fever.

The reasons why the intestinal disturbances may be considered as provocative of the fever, he says, are several: In the first place similar gastro-intestinal disturbances, independent of dentition, are usually associated with fever. Secondly, the nervous influences that tend to hinder digestion result in food stasis and the consequent absorption of semi-digested and semi-prepared albumoses, which act like bacterial toxins and cause fever. Vomiting relieves the stomach of these products and brings about reparation.

Dr. Carson thinks that too much attention has been paid to the much maligned liver and not enough to the duodenum. We heartily agree with him and welcome the suggestion that many of the cases of fever attending dentition may best be termed "duodenal fever."

ABSTRACTS

Vaccine Rashes..—G. Pernet (*Lancet,* Jan. 10, 1903), notes a large number, such as delay of the formation of vesicles for months, second crops of vesicles; incidental rashes, such as urticaria, erythema of various forms, and lichen. Impetigo contagiosa and eczema may be easily grafted on to the sore and spread elsewhere. In some cases transplantation of vaccine matter to sore points elsewhere may cause generalized vaccinia. Morbilliform and scarlatiniform rashes are more common, and of no importance. Every rash appearing after vaccination is, of course, popularly ascribed to it; thus even the itch has been accounted for. That the danger of syphilitic infection was theoretically possible with human but not with calf lymph, is well known, though an unclean lancet might still convey it. Tuberculosis from calf lymph is extremely doubtful, and so far as experiments show, leprosy cannot be conveyed by inoculation. Septic diseases, such as tetanus and erysipelas, may attack any scratch or open wound. Syphilis, psoriasis, and eczema, which are in a latent stage, may appear soon after vaccination and will be credited to it, but eczema is sometimes not aggravated and may occasionally even be cured by vaccination, and existing psoriasis does not seem to be affected by it. Whooping-cough seems to be benefited, nævi are in some cases removed by it, and according to the observation of Beavan Rake, the course of leprosy has been checked.

Congenital Goiter.—Dr. J. T. Hewetson (*British Medical Journal,* March 21, 1903) reports a case of congenital goiter, occurring in a seven months' fetus. Its neck presented a distinct tumor, identical in appearance with that of an enlarged thyroid gland, a dissection of which showed it to be a bronchocele a little larger than a hen's egg. Microscopical examination revealed no cyst formation or colloid matter. It was known to belong to the congestive or vascular type of congenital foiter. Congenital goiter generally assumes one of three types: (1) Adenomatous, being perfectly encapsuled tumors, occurring in the substance of the thyroid gland. (2) Parenchymatous, similar in all respects to that occurring in adults. (3) Vascular, in which the acini of the tumor remain fetal in character, showing an entire absence of colloid matter. Heredity plays an important part in the causation of the condition. Many of these goitrous children are born prematurely or are still-born. A considerable number of those that survive birth die soon after, from pressure of the growth upon the trachea or esophagus. The milder forms tend to disappear spontaneously, but the severer ones call for operative intervention.

A Case of Adenoids with Malaria.—Walter F. Chappell, M.D. (*Medical Record,* March 21, 1903) operated upon a child five months old for adenoids. Three weeks later, after about one week of prodromal disturbances, the child developed a high temperature, remittent in character, which reached, at one time, 105.3 degrees F. The blood showed the presence of the malarial parasite and it was proved that ten days before the attack the child had been bitten by a mosquito in a locality in which the malarial-bearing variety was shown to exist, thus rendering the case worthy of note for three reasons specially: (1) The age at which the child developed adenoids and the rapidity with which they grew. (2) Malaria in a five months' old child is very unusual. (3) The accuracy with which it was possible to fix the date of the infection.

Febrile Whooping Cough.—Quotidian Intermittent Type.—Dr. Alberto Cesaroni (*Riforma medica,* March 4, 1903). The author reports a case of whooping cough which was accompanied by a well marked febrile movement, the patient being a boy aged eighteen months. This disease is not always febrile and nearly every author speaks of a slight rise of temperature during the initial stages of the disease. During the spasmodic stage, however, the principal authorities on the subject declare that no fever occurs, or that when it does occur, it indicates the presence of some complication. A few cases are cited in literature in which fever was observed during the convulsive stage. Alfaro describes several varieties of fever which may occur in this stage of whooping cough: (1) Sudden and short accesses of fever, occurring at irregular intervals, and sometimes preceded by chills. The temperature may rise to 104 degrees F. and the attack may be single and terminate with perspiration, or it may be repeated at intervals of a number of days. (2) Protracted remittent fever lasting during the entire convulsive stage or during the greater part of it. (3) Protracted intermittent fever, usually quotidian, sometimes tertian or irregular, with or without chills. (4) Fever with a morning rise and evening remissions.

During the catarrhal period, which lasts about 15 days, the febrile movement developed. There were slight elevations of temperature during the convulsive stage, although the attacks of cough were not particularly severe. This fever was not preceded by chills; increased gradually from 1 to 4 p.m., and sank to the normal towards 9 o'clock; again rose from 1 to 4 in the afternoon and became normal in the evening. Although no complications of any kind were present to account for the fever, it continued for 11 days and ranged from 102 degrees F. to 104 degrees F. The cough presented the classical characteristics of pertussis and the author believes that he had to deal with whooping cough accompanied by fever. The course of the febrile movement is not altered by any remedy which may be administered for the cough, not even by quinine, and the prognosis of these cases is not worse than that of those without fever.

Note on the Detection of Raw Milk and Formaldehyde.—J. E. Lane, F. R. C. S. (*British Medical Journal,* March 21, 1903) has observed the following striking reaction of raw milk, which may prove useful in the examination of sterilized or scalded milk. On treating raw milk with a solution of orthomethylaminophenol sulphate, and then adding hydrogen peroxide, a very vivid deep red color is produced. The red color is so strong and pronounced that as little as one per cent of raw milk, if added to heated milk, may be readily detected. Dilute acids or alkalies, borax, or formaldehyde do not affect the reaction. Milk kept at 70 degrees C. for one hour reacts readily; if heated to 75 degrees C. for half an hour no reaction is obtained, the reaction probably being caused by the presence in milk of an oxidizing enzyme destructible by heat. Casein has nothing to do with it, for the same reagent may be used as a test for formaldehyde. On adding nine or ten volumes of milk to a one per cent. solution of the salt, and allowing the mixture to stand, a pink color is gradually produced in the presence of formaldehyde. This latter test is not of any great value, however, as other substances give the reaction.

Tuberculides.—T. Colcott Fox (*Clin. Jour.,* Sept. 3, 1902) in classifying tuberculous eruptions remarks that we sometimes find tuberculous gummata in children and disseminated lupus after fevers in childhood, and a group of tuberculous eruptions such as lichen scrophulosorum, various papular and nodular eruptions, and erythema induratum, besides miliary tuberculous ulcers with numerous bacilli, lupus vulgaris, and the necrotic scrophulo-derma. Some of these are scaly, some pustular or necrotic, and others ulcerative. In the lichen type we have a number of very small indolent papules which appear suddenly on the trunk, limbs, and particularly on the lower part of the trunk in young persons, and which tend to vanish after an indefinite period. The erythema induratum or Bazin's disease, is found on the calves of the legs and occasionally on the backs of the hands, like a gumma; it gradually destroys the skin over it, and may break down again and again through many years. Though the appearances of other forms are varied, they show the initial cellular infiltration, the plasma cell mass; they appear suddenly, cause few sensory symptoms, are bilateral in situation, and undergo various changes, such as atrophy or suppuration. The evidences of their tuberculous origin is strong, though the bacillus has rarely been found in them. Some writers have ascribed them to the effects of tubercular toxin, or dead bacilli, or to compound infections, but the pathology remains doubtful. Graham Little (*Clin. Jour.*, Jan. 27, 1903), points out that Bazin's disease is most common in young and anemic girls. It may be accompanied by other typical tubercular diseases, reacts to tuberculin, and has caused tuberculosis when the tissues have been injected into guinea-pigs, though the bacillus has not yet been found in the disease itself. Darier's term "tuberculides" applies only to lesions in which the bacillus has not been found, so that if it is discovered the disease in question must be transferred strictly speaking to the true tubercular class. Fox gives the name of acne scrophulosorum to a type seen in weakly children. The eruption is indolent and scattered about the limbs, especially on their external aspects and on the buttocks. It consists of small papular postules acuminate in the early stages. The purulent head shells out and leaves a crater, and the papule finally takes the form of lichen, leaving stains or faint scars. The patients often show other tuberculous lesions, and the eruption may disappear under a course of cod liver oil.

Circumscribed Scleroderma in a Child.—J. Brito Foresti (*Revista Médica del Uruguay*, January, 1903) reports a case of scleroderma, or morphœa, localized above the upper lip and on the cheek. The patient was a child, aged thirteen years, in whom the affection commenced with a small patch above the left side of the lip and extended from the junction of the skin and mucosa to the nares. A second patch, about three centimeters in diameter, appeared later upon the left cheek below the left labial commissure, the two patches finally coalescing. Examination revealed an infiltration of the skin, this being hard and lardaceous to the touch. The center of the lesion was pale, yellowish, and somewhat depressed, surrounded by a border, slightly elevated above the level of the healthy tissue, and having the characteristic violet hue. The condition seemed in no wise to affect the general health of the patient, and the hardness of the skin did not interfere with eating. The only etiological factor which could be invoked, in the case, was a traumatism of the lip sustained a year previous to the onset of the disease. At the time of writing the report, the lesion showed signs of retrogression.

Enemas of Bromipin.—Dr. A. Rahn (*Ther. d. Gegenw.*, V, No. 1) reports good results from the use of bromipin (brominized sesame oil) enemas, especially in infant practice. He gives nurslings per dose as many grams as they are months of age; to children over one year, from 10 to 15 gm. (2½ to 4 dr.); children over four years of age, from 15 to 30 gr. (½ to 1 oz.); and adults from 30 to 40 gm. (1 oz. to 1¼ oz.). The bromipin is added, with stirring, to from ½ to 1½ cups of tepid flaxseed or moss tea. In infantile convulsions, whether idiopathic or symptomatic, the action is said to set in within ten minutes; the rigidity lessens; only a slight tremor persists and occasional twitching of the eyelids, and the child turns on its side to sleep. The author continues the treatment for a week, giving an injection night and morning. In whooping cough the attacks decidedly diminished in severity and also considerably in frequency within ten to fourteen days' use of bromipin enemas, night and morning, and the children partook of nourishment as usual. In the third and fourth weeks only one enema was given daily. In atrophy of nurslings bromipin injections have given very satisfactory results; the oil serves as a nutrient of great value. In tuberculous processes of children, particularly tuberculosis of the bronchial glands and of the meninges, the cough was in two cases materially lessened in severity as well as in frequency; and the grave convulsions accompanying tubercular meningitis were speedily subdued and sleep produced by the bromipin enemas, the latter being repeated three or four times in twenty-four hours. In three cases of cholera morbus with symptoms of acute hydrocephalus these enemas had a good effect; an infant of eight months was completely restored within a fortnight by injections of 8 gm. (2 dr.) of bromipin night and morning, and showed no signs of neurasthenia subsequently. Finally, the author reports good results from the use of bromipin enemas in rachitis, in epilepsy, in phthisical neurasthenia, and in the excitation accompanying apoplexy and contusions of the head.

The Phosphorus Treatment of Rachitis.—Concetti (*Allg. Wien. Med. Zeit.*, Jan. 27, 1903) holds that more careful preparations of phosphorus should be made for the use of rachitic children. The failure of the phosphorus to be thoroughly dissolved in the oil base results in great irregularity in the size of the dose. The first dose may be merely the oil and the second dose double the amount of phosphorus desired. Failure also to shake well leaves a concentrated amount of phosphorus in the bottom of the bottle, which may cause an acute gastric disturbance, acute degeneration of the liver, or even death. Concetti's preparation is made in the following way: He dissolves a small amount of phosphorus in ether, and then mixes thoroughly with a little almond oil. To this is added cod liver oil and the mixture is put in a water bath and heated slightly. In this way the phosphorus will be entirely dissolved, and the ether eliminated. The best proportion is 1 c.c. of phosphorus to 100 gms. of cod liver oil, to be kept in an air-tight bottle and shaken thoroughly before using. If cod liver oil is too unpleasant, or if the stomach cannot digest it, use almond or olive oil instead. The dose should be 1-20 cg. morning and evening before meals in a teaspoonful of oil, or mixed with a dessert spoonful of the emulsion.

Uses and Action of Bromipin.—DR. HÖNIGSCHMIED (*Aerztl. Rund,* 1903, No. 6) reports that he regularly uses bromipin in all affections in which bromine preparations are indicated, and always obtains very good results. He has employed it in vertigo, cerebrospinal meningitis, nervous insomnia, recent cases of chorea, in nightmare, melancholy, epilepsy and neuralgia. In cerebrospinal meningitis after emptying the bowels, an enema of 5 to 15 gm. (1¼ to 4 dr.), according to the age of the child, of slightly warmed bromipin is given; of course, ice applications and other antipyretic treatment are not neglected. In a short while the convulsions cease, the patients become quiet and, as a rule, fall asleep. Two or even three such enemas may be given in the course of 24 hours. Details of a few specially interesting cases are given as follows: Man, with nervous vertigo and disturbed sleep; occasionally nocturnal emissions. Two tablespoonfuls of bromipin were given at night, no change in mode of living. On the second night the patient slept quietly all night; the next day he was free from vertigo, and in five days he was discharged cured. Girl of eleven; convulsions of the muscles of the jaw and upper extremities, persisting in spite of treatment the next day; no albumin; no fever; pupils normal. An enema of 15 gm. (½ oz.) of bromipin was given, and in two hours the convulsions disappeared. They returned the following day, to recede again on administering an injection of bromipin. After this a tablespoonful of the drug was given daily per os for a week; no further attacks for six weeks. Another recurrence was promptly checked by the same treatment as before, and the use of bromipin for several weeks permanently cured the case. A woman; after excitement during the day, screamed at night in a semiconscious state and with hallucinations, the attacks lasting ten minutes. A number of physicians failed to bring permanent relief. The author administered about 2 dr. of bromipin at night, soup constituting the evening meal. After the attacks ceased to appear the dose was reduced to 1 dr., which was taken for four weeks. There have been no further attacks (several months after). A woman; marked melancholy; sleep disturbed. Had taken bromides; there was bromine acne on the chest, back and neck. Still, 12 gm. (3 dr.) of bromipin were given three times daily. In three days considerable improvement set in; bromipin reduced to 1 teaspoonful in the morning, and 2 teaspoonfuls at night, and a week later to 1 teaspoonful daily, and continued thereat for four weeks; when the patient was regarded as completely cured. Case of epilepsy in an anemic girl of nineteen. Besides iron, 2 tablespoonfuls of bromipin were given daily for two months. After that there were no attacks, although a year elapsed. A girl of five years with epileptic attacks daily; 20 gm. (5 dr.) of bromipin was prescribed daily. The attacks at once became milder and did not reappear after five days. The dose was then reduced to a teaspoonful daily. The child took in all 800 gm. (27 oz.) of bromipin. There has been no relapse. An anemic boy of fifteen with bicuspid insufficiency, was suddenly attacked with convulsions of the right side of the body, and in his sleep he often talked incoherently. After giving a purgative and applying a vesicant to the nape, 30 gm. (1 oz.) of bromipin was administered, and repeated the next morning and night. The convulsions quickly became very weak and vanished completely in two days. Now 15 gm. were given only at night, and continued for a week. Tonics and iron then completely restored the patient. Dr. Hönigschmied observed good results from the use of bromipin also in nervous palpitation and intercostal neuralgia.

Diphtheria Antitoxin in Infectious Broncho-Pneumonia.—Within the past two years a number of instances in which antidiphtheritic serum has been employed with success in other infectious diseases than diphtheria have been noted. It has been employed in malignant scarlet fever, and Dr. Alcide Treille (*Amer. Med.,* Vol. 5, No. 3), has used it in malarial fever. M. Fourrier used it in the treatment of a young child who showed an angina during the course of grave scarlet fever. The case was almost hopeless at the moment treatment began, but from the first injection the coma into which the child had sunk disappeared and subsequent injections led to a rapid recovery. Since then M. Fourrier has employed this treatment in similar cases with most successful results, and he recommends it in all grave cases of scarlatina. Dr. Montgomery Paton claims that antidiphtheritic serum is a specific for sepsis and other secondary conditions which have a streptococcic causation, and for simple inflammation, trauma, etc., whether such inflammation is regarded as being a distinct entity or only an attenuated sepsis. He holds that diphtheria antitoxin has no parallel in medicine as an absorbent of inflammatory tissue, and that it has considerable influence on the coagulability of the blood. It has been found by Carrier, that while diphtheria antitoxin given hypodermically is a specific for the poison of the Klebs-Löffler bacillus and weak for the septic organisms, when given by the mouth it is specific for the staphylococcus and streptococcus and weak for the Klebs-Löffler bacillus. Dr. Paton reports its successful use in erysipelas, peritonitis, appendicitis, acute rheumatic polyarthritis, puerperal infection, secondary infection, tuberculosis, traumatisms, broncho-pneumonia (he does not say whether secondary or not), in the abscess, suppuration, etc., wherever the staphylococcus or streptococcus is to be found. Dr. Jos. O'Malley, of Philadelphia, now reports good results from the use of diphtheria antitoxin in cases of broncho-pneumonia, all secondary pneumonias of bacterial origin, complicating the various infectious diseases and exanthems of childhood.

Case I.—Aged two and one-half, had been ill with influenza; profoundly prostrated; nasal alæ dilating, respirations 70 to 75, pulse 170, temperature 105 degrees. Physical examination gave the harsh breath sounds and subcrepitation of broncho-pneumonia. 3,000 units of antidiphtheritic serum was injected into the groin—within sixteen hours of the onset of pneumonia. Eight hours later the temperature had dropped to 103 degrees, the pulse-rate to 104, respirations to 35; the defervescence continued, and the child made an uninterrupted recovery.

Case II.—Aged two. Temperature 104.4 degrees; respirations 75; pulse 150. Physical examination showed catarrhal broncho-pneumonia. Condition became extremely grave, temperature rose to 105 degrees, with increasing pulse and respirations. One thousand units of diphtheria antitoxin were used about the sixteenth hour of the pneumonia; nine hours later an extraordinary improvement in the child's condition was noticed. Defervescence occurred by lysis an dthe child made an uninterrupted recovery.

Case III.—Aged seven months. Broncho-pneumonia; as a sequel to measles. Temperature 105 degrees; autotoxemia so profound that a persistent clonic muscle tremor was present; patient unable to suckle. Two thousand units were injected into left groin. Defervescence began eight and one-half hours thereafter, convulsive tremors ceased, and paramyoclonus disappeared. Pulse dropped to 136, temperature to 101.4 degrees, and baby began to nurse. Two thousand units of antidiphtheritic serum were again injected, and defervescence continued by lysis until the normal was reached, about third day thereafter. Patient made an uninterrupted recovery.

The writer has since used the serum repeatedly in like conditions, with uniformly satisfactory results. He has also used it in scarlet fever in which the anginal symptoms were pronounced, and obtained a rapid amelioration of this symptom, and of all the distressing symptoms.

Congenital Goiter.—Dr. Hewetson (*British Medical Journal*, March 21, 1903) says in the three cases reported, p. 493, it has been noted that the mother had been taking potassium chlorate during pregnancy. Sir J. Y. Simpson reported the first of these cases in 1855, and Professor A. R. Simpson, the second in 1886. The third is the one which Dr. Hewetson has been investigating was a patient of Dr. G. A. Gibb, Birmingham. He has found the maternal history interesting. During six years of marriage the patient had given birth to seven premature babies, none of which survived. No history of syphilis could be obtained, and nothing was found in the uterus which might account for these premature births. The infant affected with bronchocele was the seventh child. The mother commenced to take 12 grs. of potassium chlorate and 9 grs. of potassium iodide daily, about the fourth week of pregnancy, reducing the dose when the child became viable, but continuing its use to the end of pregnancy. There was no history of goiter on either the mother's or father's side. The tumor consisted of the enlargement of the whole thyroid gland and was about as large as a hen's egg. Examination revealed an entire absence of cyst formation and colloid matter together with marked vascularity of the tumor itself, and increased size of the thyroid vessels. This is conceded to be the commonest type of congenital bronchocele, although the adenomatous and parenchymatous types may sometimes occur as congenital conditions. The one point of similarity in all three cases was the fact that the patients had all been subjects of numerous premature labors for which potassium chlorate had been given. That this drug is a factor in the causation of congenital goiter is a fact yet to be established.

Inhalation Treatment of Whooping Cough.—Dr. Fournier (*Ther. Gaz.*, XXVII, No. 1) of Bildah in Algeria, has published a method of treating whooping cough, which has given him excellent results in a recent epidemic. The method is that of inhalations and the preparation used is as follows:

Creosote	5 gm.
Glycerine	10 gm.
Oil Turpentine	4 gm.
Oil Eucalyptus	3 gm.
Oil Cloves	1 gm.

A mask similar to that employed in narcosis is used, and about 10 drops of the mixture is poured on the center of the mask. Violent fits of coughing are noticed at first, and the mask should be removed until the child has become accustomed to breahing the preparation. The various drugs differ in their action, some by deadening the sensitiveness of the nerve centers and others by their antiseptic action. Dr. Fournier has used this method, also, the chief drug employed being creosote. Formaldehyde, he has found, causes severe headache.

Tin as a Teniafuge.—According to Dr. I. I. Dotchevsky (*La Semaine Medicale,* XXIII, No. 2) a good teniafuge is precipitated metallic tin. It dissolves very slowly in the gastric juice and does not exert the toxic action common to the salts of tin. By experimenting on animals and on himself he has established its innocuousness. As a teniafuge he gives 0.6 gm. (9 grn.) five or six times in catchets, at intervals of 15 minutes, administering three tablespoonfuls of infusion of senna or two tablespoonfuls of castor oil two hours after the first dose. Only digestible food is given for several days afterward. Twenty-six from among 38 patients treated with tin were cured by one course, while in seven the procedure had to be repeated to obtain expulsion of the tenia, and in the remaining five cases the treatment was tried in vain twice. The author has proved that the drug does not enter the circulation, having recovered the metal from the feces and detected none in the urine.

Mode of Feeding Rachitic Children of Two and a Half Years.—(*Gaz. Med. Belge and Press Med.,* Jan. 22, 1903). The following regime in the feeding of rachitic children is recommended in the *Archives de Medecine des Infants:* (1) Feeding at 7 a.m. Bread and milk, gruel, porridge and milk, bread and butter, or an egg with a small piece of fat bacon. (2) Feeding at 11 a.m. Cup of milk with a biscuit, or bread and butter. (3) Feeding at 1.30 p.m. Bread and butter, potatoes, fish or meats, finely divided, pudding and milk, prunes or marmalades. (4) Feeding at 5 p.m. Milk or cocoa. (5) Feeding to be given a half hour before going to bed. Bread and milk. With this the child must be carefully watched and fruit and vegetables varied accordingly.

Is the Adenoid Operation a Justifiable Surgical Procedure?—Richards (*Jour. A. M. A.,* Feb. 7, 1903) objects to the foreign methods of removing adenoids without anesthesia. He describes four foreign clinics in which the operations seemed unnecessarily brutal, and not sufficiently thorough. The curetting was done superficially, and no subsequent examination made to find any portions of adenoids or tonsils not removed. In almost all cases a recurrence of the trouble was the result. At a fifth clinic in England nitrous oxid was given and the tonsils and adenoids removed with very little bleeding, and in three minutes the child was able to walk into the next room. This method for clinic work seems almost ideal, as it is accompanied by an insignificant loss of blood as compared with an ether operation, and is rapid and painless. The use of the steel finger-nail as a curet is strongly condemned. Ether is the most satisfactory anesthetic. A sharp instrument which will cut away the tissue and leave a smooth cavity is desired. Examine thoroughly, to be sure the growth has been entirely removed, and keep the child in bed for a day or two after the operation.

The Ferments of Milk.—P. NOBÉCOURT and P. MERKLEN (*La Presse Médicale*, December 27, 1902) review the work done by the discoverers of the various ferments in milk, giving in detail the differences betwen the ferments found in the milk of human beings and animals. They find that all are found in the milk of women, dogs and asses; but, while the rest are found in cows' and goats' milk, amylase and the salol-splitting ferment are absent. Thus it is that asses' milk, in its ferments, most approximates mother's milk. Investigations show that both amylase and the salol-splitting ferment exist already during intra-uterine life. Amylase is constantly present in the feces and urine of suckling infants. They conclude that the differences in the ferments found in breast-fed and artificially fed infants are quantitative, not qualitative. The literature of the subject is fully reviewed. On account of the difficulty of experimentation upon this line, there is as yet but little known of the value of the ferments of milk.

Lichen Spinulosus.—F. A. BENNET (*Australasian Medical Gazette,* Dec. 20, 1902) gives a good account of lichen pilaris Crocker in a girl fourteen years of age. The eruption appeared during convalescence from influenza on the left side of the neck, and thence spread on to the face. A fortnight later it attacked the arms and passed downwards to the hands. Finally it involved the buttocks and hips, and spread down the legs to the feet, which were left unaffected. A horny and papular eruption came out in crops, and imparted a nutmeg-grater sensation to the hand passed over it. The papules were reddish, conical and follicular, and they remained discrete throughout. From the center of most of them the typical horny caps and spines projected, which could be readily picked off in some situations, being sufficiently long to be grasped between the nails. There was no pruritus and the patient improved considerably on inunction of oil of cade in olive oil following hot alkaline baths.

The Use of Tropacocaine in Dental Extractions.—FUCHS-GOEDING (*Zahnärztliche Rundschau. Centralblatt für Zahnheilkunde und Zahntechnik,* XI, Jahrgang, No. 499, Berlin) used tropacocaine local anesthesia in over 400 extractions, trying both 5 per cent and 3 per cent solutions, infiltrating the gum, and always obtaining full anesthesia. He never saw after-effects in his operating-room, but many patients complained when they reached home, about half an hour after operation, of feeling unwell. Many complained of weakness and headache, others of tremblings in the limbs or of palpitation of the heart. Violent shivering occurred in one case and lasted for between half and one hour, when the patient went to sleep, afterwards awaking well. None of the patients, however, were seriously ill, yet the author resolved to use much weaker solutions, and availed himself of Schleich's method, under which he has done about 350 extractions, some of them in hysterical women and epileptics. No failures have resulted and he uses only Schleich's strong solution, viz.:

Tropacocaine	0.3
Sodium chloride	0.2
Distilled water	100

The needed quantity, 2 to 3 grams, must not be *injected* into the gum, but this must be *infiltrated* till it is quite anemic. Tropacocaine in the form of Schleich's infiltration as a very useful and quite harmless local anesthetic is recommended by Fuchs-Goeding.

Aneurism of the Ascending Arch of the Aorta in a Small Boy.—JORDAN (*Lancet*, Feb. 21, 1903) reports an interesting case of aortic aneurism, with the results of autopsy. The chief points of the case follow: A boy of six and one-half years, who had been the subject of otitis media since babyhood, began to suffer with headache, vomiting and fever on September 6. These symptoms grew worse until the 10th, then they began to subside, and on the 20th they left him. On the 14th the left knee began to swell. Effusion into the joint increased up to the 18th and then began to diminish, the knee being normal at the time of his death. On the 26th when he was apparently convalescent he suddenly died. *Necropsy.*—Brain and meninges normal. Tympanic cavities contained mucopurulent fluid. On the ascending arch of the aorta was a sacculated, light red swelling, in the center of which was a horizontal, slit-like opening. On the corresponding point of the inner surface of the aorta was a triangular opening. The aorta itself, the heart valves, cavities and muscle were perfectly healthy. All other organs were normal. Before death no symptom of aneurism existed. Jordan regards the condition as an acute infective aneurism, and believes that it originated as a localized septic aortitis, possibly due to a minute pyemic embolus in one of the vasa vasorum.

The Cerebrospinal Form of Typhoid Fever.—P. MOIZARD and H. GRENET (*Archives de Médecine des Enfants*, January, 1903) report a case of typhoid fever in a boy five years old, who always caught cold easily. His symptoms for one week before admission to the hospital had been headache, anorexia, insomnia, cough and constipation. Examination showed enlarged axillary and inguinal glands only. There was pain in the neck and the muscles were stiff. Rales were noted, with dyspnea. He vomited without nausea or effort, and Kernig's sign was noticed. Lumbar puncture failed to reveal any cellular elements, nor did the fluid contain iodide, though this was given internally. The Widal reaction was positive. Recovery followed in four weeks. The diagnosis depended on the presence of the Widal reaction and the absence of leukocytes in the cerebrospinal fluid. Such cases are relatively rare; the literature is fully quoted.

Diphtheria Antitoxin in the Infections or Bacterial Broncho-pneumonia of Childhood.—Dr. Joseph O'Malley (*American Medicine*, January 17, 1903) shows that a number of instances in which antidiphtheritic serum has been employed with success in other infectious diseases than diphtheria within the past two years have been noted. Dr. Montgomery Paton, of Australia, claims that antidiphtheritic serum is a specific for sepsis and other secondary conditions which have a streptococcic causation, and holds that it has no parallel in medicine as an absorbent of inflammatory tissue. The cases of broncho-pneumonia in which Dr. O'Malley has used antidiphtheritic serum were all secondary pneumonias of bacterial origin, complicating the various infectious diseases and exanthems of childhood. The author believes that we have in antidiphtheritic serum a most valuable therapeutic agent for a class of cases otherwise beyond ordinary therapeutic aid, particularly in those cases of broncho-pneumonia which so often cause a fatal complication in the bacterial diseases of childhood, such as measles, influenza, whooping-cough, and scarlet fever, although the three cases treated in this manner render it impossible to generalize.

Bromoform Poisoning with a Fatal Issue in a Three-Year-Old Child.—E. Kiwull (*Centralbl. f. innere Med.*, Dec. 13, 1902). The child whose case is reported was brought in an unconscious condition to the physician in attendance with the statement that it had been given a prescription for whooping cough that had been ordered for an eleven-year-old brother. The prescription contained 12 parts of bromoform in 100, and was to be taken in teaspoonful-doses three times a day. The symptoms of poisoning did not appear until the last dose in the bottle had been administered. The child then exhibited convulsive movements and became unconscious. In spite of ether injections and prolonged artificial respiration, the child soon died. The post-mortem examination showed slight congestion of the lungs; the blood in the heart and in the great vessels was fluid; there was almost no fluid in the cranial cavity, the pia was much injected, and the brain showed numerous points of congestion. A chemical examination of the contents of the stomach and the intestine did not show the presence of bromoform poisoning. The reason that the symptoms appeared only after numerous doses had been given is probably that the heavy bromoform had sunk to the bottom of the bottle.

Paralysis of All Four Limbs and of One Side of the Face, with Dissociation of Sensation, Developing in a Few Hours and Resulting from Meningomyeloencephalitis.—Charles K. Mills and William G. Spiller (*Journal of Nervous and Mental Disease,* January, 1903), in the study of the cases reported, found that the paralytic, sensory and reflex symptoms of a grave type developed gradually and after a period in which the symptoms of meningeal irritation were prominent. Eighteen days elapsed before indisputable symptoms of involvement of the cord were exhibited, and twenty days before the paralysis was complete. The extensive meningeal inflammation was shown by the rigidity of the back and also probably by the hyperesthesia of the extremities. Paralyses of all four limbs were complete in five hours, and the grave sensory, reflex and visceral phenomena came on with almost equal rapidity. With the exception of pain, meningeal symptoms were absent. Basal symptoms were present and developed in the tubercular case late in the disease, while the facial paralysis was a prominent feature in the paralytic syndrome which came to the surface in the short period of five hours.

Pyranum, an Antipyretic and Anodyne.—Dr. E. Schlesinger (*Ther. Monatsch.*, XVII, No. 1) reports on the use of pyranum in 146 cases, comprising various forms of rheumatism, sore-throat, pneumonia, pleurisy, whooping-cough, phthisis, neuralgia, migraine, and pains in general. This drug, which is described as "a compound of benzoic acid, salicylic acid and thymol in the form of a water-soluble sodium salt," occurs as a white, slightly hydroscopic powder, of an aromatic odor and mild, sweetish taste; it is soluble in five parts of water and in ten parts of alcohol. The author characterizes pyranum as "a mild antipyretic and a powerful and reliable anodyne, free from untoward effects." He usually administers it in 0.5 gm. capsules, sometimes dissolving it in half a glassful of cold water or milk. The dose as an anodyne in neuralgias is 1 gm., or 2 gm. (30 grn.), and this may be repeated once after the lapse of at least 45 minutes; the antifebrile dose is from 0.5 to 0.75 gm. (7½ to 11 grn.) three times a day.

Congenital High Position of the Scapula with Partial Defect of the Trapezius and Movable Kidney in a Boy of Twelve.—A case is reported by Hoeldmoser (*Wiener klin. Woch.*, XV Jahrgang, No. 52, Dec. 25, 1902) in which there was an absence of the lower portion and shortening of the trapezius muscle on the same side, and right-sided movable kidney. In the extremities spastic symptoms were shown which suggested the juvenile form of progressive muscular atrophy. The article is illustrated by photographs and many details are given.

Diagnosis of Tuberculous Peritonitis In Children.—Kissel (*Arch. f. klin. Chirurg.*, Vol. LXV, Part II.) says: As a result of the study in fifty-four cases of tuberculous peritonitis he reaches the following conclusions: (1) Tuberculous peritonitis is more common in children than is generally supposed. (2) It can be laid down as a general rule that all cases of so-called spontaneous ascites are really due to tuberculous peritonitis. (3) Not infrequently the exudate in the peritoneal cavity will disappear under general tonic treatment, and the child will regain complete health. (4) In the majority of the cases the onset of the disease is imperceptible. The parents first notice that the child becomes pale and thin without apparent cause. (5) The presence of a coincident serous pleurisy is strong confirmatory evidence in the diagnosis of tuberculous peritonitis. (6) Thickening of the parietal peritoneum is the most valuable sign in the diagnosis of tuberculous peritonitis. This sign can be readily elicited before adhesions have formed by picking up a fold of the anterior abdominal wall and palpating the peritoneum between the thumb and fingers, provided the examiner is accustomed to the palpation of the normal peritoneum. (7) In exudative tuberculous peritonitis the fluid obtained by tapping is rich in albumin and has a high specific gravity. (8) In many patients who present no subjective symptoms and only moderate objective symptoms the whole peritoneum is covered with a thick layer of tuberculous masses. (9) Chronic ascites due to tuberculous pericarditis affords the greatest difficulties in differential diagnosis, but this condition is rarely seen. (10) Only in rare cases does tuberculous peritonitis have a severe onset.

Chloroform in the Preparation of Vaccine.—A. B. Green, (*Lancet*, Vol. clxiv, No. 25 of Vol. i, p. 1738, June 20, 1903), in a preliminary communication, describes what seems to be a real advance in the preparation and preservation of vaccine. Of necessity the calf's lymph is more or less contaminated with the pus-forming bacteria. Preserving it in glycerin has so far proven to be the best method of treating lymph; it eliminates the extraneous bacteria by the germicidal action of the glycerin. It takes several weeks for the various non-spore-forming bacteria to be destroyed by the glycerin, and a much longer time for the specific organism of vaccine to be acted upon. To have an efficient glycerinated lymph, it must be seasoned—that is, it must be kept until the extraneous germs are killed, but must not be so old that the glycerin has acted on the specific organism upon which the lymph depends for its efficacy. In the writer's methods the vaccine emulsion is prepared by triturating vaccine pulp with distilled water. The water is essential, so that later chloroform may be dissolved in it. Ordinarily three parts by weight of water is mixed with one part of pulp. Should a more viscid emulsion of vaccine be desired, glycerin may be added without interfering with the action of the chloroform. The newly made vaccine emulsion has chloroform added to it by passing sterile air through the chloroform and then through the mixture. It is essential that no liquid chloroform be allowed to pass through into the vaccine, as this destroys the potency of the lymph. This chloroform vapor destroys within a few hours the non-spore-forming bacteria, and does not affect the potency of the lymph. It is also a good preservative, and by this means a glycerinated lymph may be ripened in a few hours, and made available for use. The especial value of such a method is that the extraneous microorganisms are eliminated in a few hours, and the vaccine is ready for distribution. This is important in cases where there is great demand for vaccine. So long as the vaccination value depends upon the activity of a living organism, deterioration must occur in time. The potency of some vaccines, glycerinated or otherwise, is impaired within a few weeks after collection—that is, within the time required for glycerin to exert its full influence in eliminating extraneous organisms. Some of these vaccines may, at the time of their collection, have possessed a high vaccination value. Vaccine prepared by means of the chloroform process can be used at once, before its activity has deteriorated.

Breast Feeding from an Obstetrician's Point of View.—EFFA V. DAVIS (*Journal of the American Medical Association*, Vol xl, No. 25, p. 1697, June 20, 1903) comes to the conclusion that it is not always the quantity or quality of the breast milk which prevents successful breast feeding, but it may be due to an idiosyncracy in the child, due to some dyscrasia. It is not fair to the infant to allow it to remain sick and in distress because of a paltry ounce or two of breast milk, just for the sake of having it breast fed. A careful study of the child should be made in all cases where indigestion appears shortly after birth, and when possible a milk analysis should be performed. In large cities where municipal laboratories exist, the assistance of an expert chemist would be of value in lessening the mortality of infants during the first month of life. The writer gives six case histories illustrating these conclusions. In the first five all of the infants presented signs of indigestion in the first week of life. Four had a family history either of rheumatism or eczema, and two of both. All of the first five infants recovered promptly under an artificial diet containing cow's milk modified, and all but one did better when some malted preparation was used. All of the mothers desired to nurse their babies, and two had successfully done so in the case of other children.

Paroxysms of Whooping-cough Treated by Pulling the Lower Jaw Downward and Forward.—JACOB SOBEL (*Archives of Pediatrics,* 20th year, No. 6, p. 418, June, 1903) says that the trend of treatment in whooping-cough is largely in the direction of lessening the number and severity of paroxysms. It is found that the frequency of complications is largely dependent upon the severity and duration of these attacks. Two years ago Caillé said: "The attack of spasmodic whooping-cough which you notice is now coming on can be checked by pressing forward the lower jaw, as you would in a narcotized patient who was not breathing properly. In some children whooping-cough attacks are so severe that they will end in convulsions, and it is well to know in what manner such an attack can be easily stopped." Since June, 1901, Sobel has tried this method in ninety-six cases, and among these had only nine failures. Two of these occurred in cases where there was no whoop. These were all dispensary patients, and it is possible that in the cases in which the method failed it might have been successful if carried out regularly at home. In infants and young children the method was less efficacious than in older ones, though in some quite young children it acted remarkably well. This method was first suggested by Naegeli, who published it in 1889. Since that time there has been little reference to it in the literature, and no mention in the standard works on pediatrics.—*Medicine.*

Addison's Disease with Integrity of the Suprarenal Capsules.—RICHON (*Archives de Médecine des Enfants,* tome vi, No. 6, p. 350, 1903).—Authentic cases of Addison's disease, in which the suprarenals are intact, are sufficiently rare to justify the report of such a case. It throws doubt upon the exclusive glandular theory of the bronze disease. It is manifest that the nervous disorders are responsible in part for the symptoms. The case was that of a girl of ten years, who entered the hospital in June, 1899. The symptoms of her illness began two months before, characterized by fatigue, mental depression and inability to pursue her studies. The appetite failed, the abdomen was tender, but there was no vomiting. Soon after there appeared a darkening of the skin, most marked on the face and hands. It gradually deepened until the bronze skin presented a very striking contrast to the somewhat lighter hair. A subcutaneous injection of suprarenal caused agitation and vomiting. The same remedy was then given by the mouth, and was followed by improvement in the mental condition and a lessening of the weakness. The skin also grew lighter. After a while she left the hospital, only to have a return of the pain in the abdomen with vomiting. The further administration of suprarenal occasioned no improvement, and the patient died about a year after the beginning of the symptoms. The autopsy showed tuberculous infiltration of the lungs and enlargement of the bronchial glands. The suprarenal capsules were congested, but microscopically they presented no lesions. A microscopic examination revealed no change in the histological structure. The capsule was of normal thickness, and the gland as a whole was not enlarged. The nuclei of the cells were distinct, and there was no fatty degeneration. The semilunar plexus was somewhat altered and congested. The mesenteric glands were large, but not caseous. Upon examination the bacillus tuberculosis was absent.—*Medicine.*

BOOK REVIEWS

INTERNATIONAL CLINICS. Edited by A. O. J. KELLY, A.M., M.D., Vol. 1, Thirteenth Series, 1903. J. B. Lippincott Co., Philadelphia.

Volume 1 of the Thirteenth Series of International Clinics comes to us with a rich supply of articles mostly contributed by American authors. The departments represented are those of treatment, medicine, surgery, pediatrics, orthopediatrics and special articles. In addition to this there are more than seventy pages devoted to medical progress in medicine during the year 1902. There is an excellent colored frontispiece illustrating aneurism of the diseased thoracic aorta, which has ruptured into the esophagus, contributed by Dr. William Osler.

Dr. R. W. Wilcox has a series of papers on "Cardiac Fibrosis (Hodgson's Disease), Before Treatment of Anemia, Anemic and Vascular Murmurs." Dr. Jonnesco, of Bucharest, contributes a very interesting article on "The End Results of Total Bilateral Research of the Cervical Sympathetical in Basedow's Disease." More particularly on the subject of pediatrics, Dr. John Thompson, of Edinburgh, contributes a timely article on "Convulsions in Young Children," and Dr. A. R. Shands, of Washington, has a very practical article on "Weak Feet and Flat Feet." The reviews of current literature are exceptionally good, especially from the illustrative standpoint. We wish the "International Clinics" the continued success that its enterprise deserves.

KLINISCHE VORLESUNGEN ÜBER KINDERKRANKHEITEN. By NIL FILATOW, O. Professor der Kinderheilkunde an der Kaiserlichen Universität und Director des Chludow'schen Kinderspitals in Moskau. Translated by G. Turk, E. Rahr und L. Martinson. Franze Deuticke, Leipzig and Wien.

In this series of lectures by Prof. Filatow we have a collection of more than usual interest. The author has been known as one of the most thorough of the Russian pediatrists, and his sudden death in 1902, took from among the groups of Russian specialists in children's diseases one of its most worthy exponents.

The variety of subjects treated is an indication of the versatility of the man's mind. Thus in the first volume there are 23 separate discussions and in the second some 20, the two volumes together making a work of 360 pages.

Chronic tuberculosis, peritonitis, chronic serous peritonitis, influenza, phimosis, pyelocystitis, nephritis, edema in children without albuminuria, scrophula, the treatment of rachitis, chronic intestinal catarrh, malarial cachexia, idiopathic atrophies, dyspepsias of the breast-fed infants, cerebro-spinal meningitis, chronic hydrocephalus, pseudo meningitis, acute ataxia, ataxia in the young, weakness of the upper extremities and paraplegia in children, treatment of chorea in children, the bulbar symptom complex in children.

These comprise the subjects discussed in the first volume. In the second volume an equally interesting series of histories and discoveries are presented. These are on prolonged fever processes in children, profound and afebrale forms of influenza, chorea, Basedow's disease, pseudohypertrophy, Little's disease, Strümpell's paralysis, diphtheritic paralysis, croupous pneumonia, central pneumonia, pleurisy, treatment of cough, acute miliary tuberculosis, vulvitis, catarrhal jaundice, hypertrophic cirrhosis of the liver, congenital weakness of the heart and gastro-intestinal disease in children. Such are the contents of the second volume.

While it is true that a series of histories is rarely read with enthusiasm, the present series, because of the richness in therapeutic suggestions and notes, makes it one of unusual interest.

PEDIATRICS

VOL. XV. SEPTEMBER, 1903 No. 9

ORIGINAL ARTICLES

RHEUMATISM IN CHILDHOOD.*

BY ALFRED FRIEDLANDER, M.D.,
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CINCINNATI.

The etiology of articular rheumatism is a subject that has engaged the attention of both pathologists and clinicians for a long period of time. As a natural result, various theories have been advanced, only to be subsequently rejected in the light of later investigations. Climatologic and meteorologic changes, heredity, perversions of metabolism with resulting abnormal chemical processes, and bacterial infection have all been announced as prime exciting causes of this affection.

With reference to climate, to seasonal conditions, and heredity, we may say at once that, while they may be predisposing factors in many cases, they cannot possibly be considered as the sole causes. We do know that rheumatism is more common in certain climates and certain seasons of the year than others; we do know that certain families are "rheumatic," and yet we recognize after all that these things do not explain the incidence of the individual attack. Among the theories advanced to supply this missing link of knowledge, those of perverted metabolism, with resulting chemical changes, held sway for a long time. Thus Prout believed that the disease was due to an excess of lactic acid in the blood. Inasmuch as the normal amount of lactic acid in the human body is, even to-day, not definitely known; inasmuch, too, as we have no reliable practical quantitative test for lactic acid in the blood, it is difficult to see how such a theory is to be substantiated.

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*Read before the Ohio State Medical Association at Dayton, O., June 4, 1903.

Haig, and many others, believed that the disease was due to excessive formation of uric acid in the blood, but later investigations have shown that this theory does not rest upon any solid foundation of fact, in that the surcharge of the blood with uric acid cannot be demonstrated. The latest theories, and the most plausible ones (not because of their newness, however), would assign rheumatism to the category of diseases caused by microbic infection. As we see it in adults, rheumatism in its onset, its manifestations and its course, presents a striking similarity to other infectious diseases. The typical febrile movement, the evidences of constitutional infection with local manifestation, the self-limited course with, at times, relapse dependent upon reinfection, offer an analogy to other infectious processes much too close to be merely coincidental. Added to this, various investigators have succeeded in isolating germs from the various organs post mortem, from the blood and rheumatic nodules *intra vitam.* Especial mention should be made of the work of two English observers, Poynton and Payne, who claim to have demonstrated absolutely that the exciting cause of rheumatism is a definite diplococcus. While it is perhaps not possible to accept this particular claim as absolutely proven, it is more than probable that the exciting cause of the disease will be found to belong to the pyogenic group of bacteria. If we conceive of an attenuated form of virus of this kind, without attempting to specify any species as yet, we can understand the theory which explains rheumatism as a more or less mild septicopyemia.

Naturally enough, the question at once arises as to how the germs gain entrance into the system. It is altogether probable that in the majority of cases the tonsil is the primary seat of infection, as was shown by Leyden, Meyer and Singer. Recently Menzer has demonstrated the presence of streptococci in the peritonsilar tissue in rheumatism. This is important, for it goes to show that we may have infection, not only through the tonsil, and thus into the lymphatic circulation, but also through the peritonsilar tissue, and so through the general systemic circulation. It is in this light that we are privileged to regard rheumatism as a true blood-poisoning, a true septicemia.

At the same time this theory takes due cognizance of those causes previously alluded to as merely predisposing, for it is easily conceivable that climatic, seasonal or hereditary conditions might so lower the bodily resistance that the germs would find entrance, and then upon suitable soil have the opportunity for subsequent development.

In a recent address Rotch emphasized the fact that pediatrics, as such, does not concern itself so much with the diseases *of* children, because there are not many diseases incidental to childhood alone, but rather with the manifestations of disease *in* children, with the special peculiarities of disease which the period of childhood induces.

Rheumatism offers an excellent illustration of the case in point. Its clinical manifestations, as seen in childhood, are very different from those of adult life. In the first place, the arthritic symptoms are not nearly so well marked. In many cases we do not have the sudden onset with high fever, red, swollen, and intensely painful joints and the severe constitutional depression that form the symptom-complex in adults. The joints may not be greatly reddened and swollen. Indeed, it is a point worthy of special insistence that the pain is not always referred to the joints at all. We have come to know, for instance, that the so-called "growing pains" of children are frequently rheumatic in origin, and to appreciate, furthermore, that at times they are the only rheumatic pains from which children suffer. Though arthritis is at its minimum, endocarditis is at its maximum in the rheumatism of childhood. As a matter of fact, the modern view inclines to the belief that heart-lesion is not to be regarded as a complication of rheumatism in the child, but as one of the manifestations. The close association of rheumatism, endocarditis and chorea has been recognized for a long time. and by many are now regarded as merely different phases of the same morbid process. Nor is it to be forgotten that rheumatism need not necessarily precede the other affections in point of time, nor must all three conditions be present in a given case. As Cheadle has put it, "Any one of the phases may be absent, one only may be present, or two, or all three. The different manifestations, again, may occur not only in any order and combination, but separated by varying intervals of time; following one another in quick succession, or some appearing months or years after the rest. Thus an endocarditis, or a chorea, may occur first and alone, the joint affection long after."

In addition there are certain symptoms of rheumatism in childhood that demand special notice. *Peliosis rheumatica* is quite common in childhood. In many cases the child sickens with what appears to be an ordinary tonsilitis. After a varying interval, usually measured in days, the characteristic purpuric rash develops, usually about the extremities. The spots are usually purple in color, of variable size, most often tender on pressure. In some cases the rash becomes generalized. Arthritic symptoms may develop, but need not. In a case recently under treatment in the children's ward of the Jewish Hospital, the tonsilitis and rash with the usual febrile movement and constitutional disturbance were present without arthritic symptoms. The history of the case showed that the boy had had several distinct attacks of articular rheumatism. Under the salicylates improvement was rapid. This condition is in all probability to be regarded as a "rheumatic equivalent," and its occurrence in a given case affords strong presumptive evidence of a rheumatic diathesis.

Rheumatic nodules also occur more often in the rheumatism of children than in that of adults, although in this country they are rare in either form. These nodules, first described by Barlow in 1881, are subcutaneous masses of fibrin, cells and fibrous tissue, varying in size from a pin-head to that of a small bean. They are most apt to occur over the malleoli, at the margins of the patella, or along the extensor tendons of the hands, fingers or toes. There is at the present time in the Jewish Hospital a boy twelve years of age suffering with articular rheumatism, who presents an exquisite picture of this rheumatic manifestation.

This case is of more than ordinary interest, and it therefore may be permissible to detail a few points of the history. The boy presents various manifestations of late hereditary syphilis, the specific dactylitis being especially well marked. The accompanying photograph, unfortunately not good, gives some idea of this manifestation. For two years this boy has been subject to attacks of acute articular rheumatism. On admission, there was moderate fever, swelling and pain of both ankles and wrists. Rheumatic nodules were particularly distinct along the extensor tendons of the right hand. The heart was markedly dilated, the dulness extending two fingers' breadth beyond the midclavicular line on the left, and beyond the sternal margin on the right. A double murmur was heard at the apex. At the junction of the third rib with the sternum on the left side was heard a typical pericardial rub. Here we had the combination of arthritic manifestations, with endopericarditis, as we frequently find it in these cases.

Another symptom of rheumatism in children, often of diagnostic importance, is recurrent epistaxis for which no local cause can be found. The mechanism of its production is not clear, and yet the association occurs so frequently that it cannot be a mere matter of coincidence. Last year Phillips reported ten cases of epistaxis all associated with rheumatism. The occurrence of so-called idiopathic nose-bleed in children is therefore frequently suspicious.

While the diagnosis of rheumatism in the adult is, as a rule, not a matter of difficulty, its recognition in childhood is not always easy. This is because of its atypical onset and course. Thus the onset of an endocarditis, which, as we have seen, may be the initial phase of the disease, is often very insidious.

Even the most careful examination may fail to reveal anything wrong with the heart other than a slight weakness, some irregularity and greater rapidity of action, though sometimes a faint murmur may be heard. The general constitutional symptoms of languor, depression and anorexia are not at all specific. It is in these cases that careful observations of the temperature, continued over periods of time, are of great value. Continuous fever with slight remissions, even though of comparatively low degree, not explainable by the other definite infection, is one of the most reliable signs of beginning endocarditis that we have. Indeed, in an article entitled "Endocarditis and the Use of the Thermometer in its Diagnosis," Brunton goes so far as to say, "If you find a murmur at the heart, or even in cases where you can find no murmur, if you find a temperature which runs a course much like that of quotidian ague in a case where you can trace no malaria, and where you can find no indication of suppuration, it is very likely indeed to be a case of endocarditis."

Again it is to be remembered that the chorea is not necessarily of the clear unmistakable type which allows a diagnosis to be made at sight. Very frequently the child is simply "nervous," awkward at play or at table, usually restless or irritable, showing only indications now and then of the characteristic choreic movements.

Of course, when all is said, in most cases the diagnosis is not difficult. But, as Holt has put it, the disease is more frequently overlooked than confounded with other diseases. In doubtful cases especial attention should be paid (a) to the family history, (b) to the previous history of the patient as regards slight joint stiffness without swelling, growing pains, nose-bleed, frequent attacks of tonsilitis and erythema, (c) the examination of the heart for signs of endo- or pericarditis and (d) the temperature. Careful search will sometimes reveal the presence of the tendinous nodules.

It must not be forgotten either that in the rheumatism of childhood, even in marked cases, we do not have the successive involvement of many joints as we do in adults. In children we very frequently have very few joints involved, and in many cases, certainly not gonorrheal in origin (though gonorrheal rheumatism is not rare in childhood), but a single joint is involved. With reference to prognosis, it need hardly be said that the rheumatism in itself is rarely dangerous. The danger lies in cardiac manifestations. Unfortunately, one attack greatly predisposes to subsequent ones, and so the heart, which at first may escape, may in a recurrence become affected. Prophylaxis plays an important *rôle* in the care of rheumatically inclined children. In cases in which the family history shows the existence of rheumatism, the predisposed child should be carefully watched. The indefinite symptoms before referred to demand attention; exposure to damp weather, rather than to cold weather must be avoided as much as possible, and such definitely rheumatic symptoms as growing pains, recurring torticollis, etc., should receive appropriate treatment. In the line of prophylactic treatment too comes proper attention to the condition of the child's throat. The existence of adenoid vegetations and of enlarged tonsils especially, is a matter of concern, inasmuch as the tonsils doubtless form the port of entry for the rheumatic virus in many cases.

With reference to the actual management of these cases, it is well to remember that rheumatism in childhood is apt to extend over a long period, frequently measured by-years. Crandall has expressed this idea very aptly in discussing the management of "rheumatic children" rather than simply the question of rheumatism in the child.

The relation of diet to rheumatism is still a question *sub judice*. While the uric acid theory of causation held sway, it was believed that nitrogenous foods were to be strictly eliminated from the dietary. The prohibition extended even to animal broths and eggs. It appears certain now, that rheumatic children do best upon a generous dietary, in which the special limitations are to be applied to the sugars and starchy foods. Malnutrition is frequently a factor to be considered in these cases, anemia is almost the rule. Under the circumstances, a liberal, nourishing diet, with moderate amounts of the more easily assimilable meats, with plenty of green vegetables, will be found to meet the indications most often. Special mention should be made of milk, which should be taken in large quantity.

Rheumatic children should wear flannel underwear the year round, its weight being varied according to season. Its value in diminishing the danger of chill is fully established. While exposure to cold itself is to be avoided when possible, it should be remembered that damp weather, with cold east winds, with the ground covered with slush, is especially favorable for the development of rheumatism. For the actual attack the salicylates, in combination with bicarbonate of soda, offer the best plan of treatment. In order to get good effects from the salicylates, the quantities used must be rather large. While it is doubtless true that these drugs are somewhat depressing to the heart, it is just as true that children ordinarily stand proportionately large doses. When the case can be carefully controlled, the use of large amounts at the outset so as to mass the effect, is of decided advantage, though this plan of treatment demands watchfulness on the physician's part. The salicylates certainly have a marked analgesic effect, even though there be some doubt as to their value in preventing cardiac trouble.

Local applications to the joints, if they be inflamed, are not always necessary. Simple wrapping of the joints in cotton batting is usually sufficient, though at times it is well to immobolize the joints by splints. Occasionally, the local application of 2 per cent salicylic acid ointment has seemed to give some relief. The rapid development of severe anemia is one of the characteristics of rheumatism in childhood, and this needs to be met as soon as possible by the administration of ferruginous tonics. Indeed, as a matter of fact, the treatment of the acute attack itself is nearly always very simple. The point to be remembered is the necessity for keeping these children under constant observation for long periods of time. The danger of cardiac involvement, grave under any circumstances, is heightened by the tendency to frequent recurrences. The after-treatment is, therefore, of importance. One very necessary factor in this after-treatment is rest. The child should be kept abed for some time after the subsidence of all acute symptoms, even though an examination of the heart be negative. Prolonged rest, which means absence of cardiac strain, is one way of preventing heart lesion, a way not always successful of course, but a method of treatment worth trying in any case.

On the theory that rheumatism is of bacterial origin, and that the salicylates have a bactericidal, or antitoxic effect, it has been recommended to administer small doses of salicylates at intervals (say during one week each month), for long periods of time. This is to be done even where there are no distinctly rheumatic manifestations in the hope of warding off attacks. This line of treatment has proved successful in a number of cases. But after all, the therapy of rheumatism in childhood is not a matter of drugs alone. Proper clothing, regulation of exercise, avoidance of exposure, prevention of anemia, and lastly (and perhaps most important), attention to the condition of nutrition by the enforcement of a properly regulated diet will be found to be our most reliable aids in the management of a condition always troublesome, and frequently serious.

THE CONTROL OF FEVER AND CONVULSIONS OF INFANCY AND CHILDHOOD.[1]

By Thomas J. Long, M.D., Atoka, I. T.

It is my intention in this paper to endeavor to present briefly and in as practical a manner as possible some of the salient features of the treatment of fever in children, and to speak of convulsions only in their connection with fever as their cause.

To treat a fever intelligently, we must first know something concerning its production and of its results or phenomena. The temperature of the body is under the control of the nervous system, chiefly the trophic and vaso motor centers, and as long as these centers keep in working order they maintain a normal temperature. But when from any cause these centers are disturbed and they fail to perform their proper function, we have as a result an abnormal temperature. When this cause affects the vaso motor centers as from shock or some poison which is suddenly turned loose in the circulation we have a temporary paralysis of this center, and the result is a subnormal temperature, and if severe and of sufficient duration, a chill. On the other hand, if this poison continues in the circulation for a sufficient length of time, or, if you please, this shock is of sufficient severity, we have as it were a knocking down or loss of power of the trophic centers, or, in other words, of those centers which control tissue waste and tissue repair, and the result is a check in the process of tissue building with an increase in tissue waste and, as a result of this increased waste, we have increased combustion. This means, necessarily, an over production of heat, and this surplus heat we term fever.

From this fever we have resulting its various phenomena, some of the most marked of which are, reduced alkalinity of the blood, scanty secretions, increased excretion of carbon dioxide and urea, dry skin, great thirst, increased heart action, etc.

These phenomena are the natural results of the increased combustion. The reduced alkalinity of the blood is the result of the combustion going on in the tissues, which is a process of acidification, and, as the law of the diffusion of liquids is from the acid to the alkali, this diffusion takes place from the tissues into the blood vessels. Thus reducing its alkalinity, also explains the scanty secretion and dry skin.

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[1] Read before the Indian Territory Medical Association at South McAlister, June 3, 1903.

The great thirst is the call of nature for liquids to hold in solution the products of combustion. The increased heart action is a result of the abnormal condition of the blood, the nutrition of the heart is interfered with and its power lessened, which also accounts for the lessened blood pressure we sometimes have accompanying fever, when really the vessels contain more fluid than normally. The increased excretion of carbon dioxide and urea represent the smoke and ashes and are the natural products of combustion.

This knocking down or, if you please, loss of power of the nervous system, may be from two causes. First, a cause which acts only temporarily and then ceases to act, and gives only a temporary rise of fever, e.g., that following shock or an aseptic operation. Second, a cause which continues to act as a poison circulating in the blood. Such are the fevers of ordinary medical diseases.

The symptoms of fever in general, from whatever cause, are, loss of appetite, headache, backache, dry and coated tongue, sordes on the teeth, restlessness, nervousness, and, in children, frequently convulsions.

From the foregoing we must conclude that the treatment of fever resolves itself into two measures. First, means by which the normal nervous action may be restored. This, of course, must be a slow physiological process of repair, and we cannot hope for any immediate and marked effects.

Second, means by which the consequences of nervous failure may be arrested, that is the removal of the cause or, in other words, the removal from the blood of the poisons which produce this nervous failure.

For this purpose we have as yet few specifics, e. g., quinine in malaria, so our treatment for the reduction of temperature alone must be palliative. But from the foregoing, we must conclude that it should always be stimulating and never depressing, and of a nature to aid, as far as possible, in the restoration of the proper function of the nervous system.

The measures to control fever may be divided into those which simply abstract heat, and, second, those which restore the normal condition of the body. Under the first we have no remedy which abstracts heat alone. But under this head we may place the applications of cold in its various forms; but this does much more than simply abstract heat. It also exerts a stimulating effect, as is proven by the fact that, when properly applied, the temperature is not only reduced but remains so for some time after its withdrawal.

Under the second head come those remedies which replace or restore the normal condition.

Under this head we place the various stimulants which aid the nervous system to gain control of the processes of tissue repair and tissue waste.

Thus we see the temperature fall under the administration of strychnine, whisky, digitalis, etc. From whisky we get even more than the stimulant effects, it being readily combustible, takes the place of the tissues in this process, thereby reducing the production of heat.

Under this head comes also the alkalies and the ingestion of bland liquids, which restore the alkalinity of the blood, thus promoting the normal secretions.

In the administration of the alkalies we should be governed by the condition of our patient, the potash salts being slightly depressent, the soda salts neutral, and the salts of ammonia stimulants. In all the salts of the vegetable acids should be used, e.g., the citrates and acetates.

There is still another class of remedies, namely the arterial sedatives and depressents. These, I think, we are scarcely ever justifiable in using. These are the coal-tar products, aconite, etc., which give only temporary results by either depressing the circulation or by combining with the red blood cell, reducing its oxygen-carrying power, thus resulting in more harm than good.

The control of fever in the child does not differ in the main from that of the adult, but there are some essential points that should be observed.

The temperature in the child is a very important point in the diagnosis, and a temperature of moderate height with no marked constitutional symptoms should not be interfered with until we have determined, if possible, its cause. But, on the other hand, if there is any serious symptoms produced by the fever, such as convulsions, delirium, etc., we should institute active measures to reduce such a fever at once. In other words, it is not the number of degrees of fever that call for treatment but the effects of such a fever that is a better index for treatment. The child with a temperature of 104 that is resting quietly does not demand treatment as does the one with a much lower temperature, but with muscular twitching, restlessness, delirium and perhaps convulsions.

The application of cold, I think, is the most rational means of controlling the fevers of childhood. By this I do not mean that it is always necessary to use ice or the ice cold bath, but the degree of cold should be regulated to suit the particular case in hand. In many instances the temperature may be controlled by very moderate degrees of cold, e.g., a bath from 85° to 90° F., lasting from five to twenty minutes, and should always be begun at about the temperature of the body, and gradually reduced until we get the desired effect. The cold pack is a most excellent means of combating the fevers of children. This is best applied by wrapping the child in a sheet wrung out of water at a temperature just a little below that of the body and then adding, gradually, cold water until the desired temperature is reached. In this way the temperature may be very materially reduced in twenty to thirty minutes without any shock whatever. In fact, it acts as a stimulant, producing rest and sleep.

If there is any marked cerebral symptoms or delirium, this may be best controlled by the application of cold to the head, and I have obtained better results by pouring cold water over the head than by the application of the ice cap. This may be continued for twenty to forty minutes without any bad results.

The cerebral and spinal symptoms may be very materially relieved by the application of crushed ice to the back of neck and occipital region, and I believe that better results are obtained by applying the ice wrapped in cloths than the application of dry cold by means of the ice bag, and also that there is less danger of freezing the parts in this way.

In the fevers of malaria and the various bowel troubles of children accompanied by more or less congestion of the abdominal viscera, I have obtained excellent results from the application to the abdomen of cloths wrung out of ice cold water, not only reducing the fever but also relieving the pain. In all febrile diseases of children it is very essential to empty the bowels, more especially if there be convulsions. This is best accomplished by the use of calomel or castor oil. In this way we prevent the absorption of poisons from the alimentary canal, also deplete the system, thus reducing the congestion, and in this way preventing convulsions.

So far as the medicinal measures for the reduction of fever in children are concerned, I think only the alkaline fever mixtures deserve mention. A favorite prescription with me being one of the following composition: Potas, bromide, potas. acetate or citrate, and nitrous spirits of ether. This restores to a certain extent the normal alkalinity of the blood, arouses the secretions, and the bromide quiets the nervous system, preventing and controlling the convulsions.

As for the coal tar products I think they are seldom if ever indicated in the treatment of children.

A CASE OF POPLITEAL ANEURISM IN A YOUNG BOY

By J. F. Black, White Plains, N. Y.

The sufferer was a medium sized, blonde boy of nine years and six months old. He had been perfectly healthy, and had no diseases till he was five and one-half years old, when he came down with measles. The attack was mild and he made a complete recovery. Six months later he developed a case of tonsillar and faucial diphtheria, which caused very severe systemic poisoning, and at one time the child's life was despaired of. But he ultimately recovered, with no serious complications arising during the course of the disease. When convalescence was about completed, he complained of a severe occipital headache, which lasted all day, being worse in the afternoon and evening. These headaches occurred about once in three months. Prior to the diphtheria the boy had been able to sing quite well, but afterwards his mother says he can only "sing through his nose." He was able to continue his schooling, rarely missing a day, and progressed well in his studies. The father and mother have always been healthy, with the exception of an occasional attack of malaria. Syphilis is absolutely denied, and there is no history of other constitutional diseases. The mother has had eight living children, one died at two months, cause unknown, and another of diphtheria. The remaining, except the one in question, are perfectly healthy. There were two abortions, five and three years ago, respectively.

I was called to see the patient on April 17, 1902. He complained of difficulty in breathing, loss of appetite, and inability to sleep. His age at this time was about nine years and six months. On physical examination all the organs appeared healthy excepting the heart, and here, as a friend remarked, "every kind of a murmur could be heard." The principal lesion, however, was an incompetency of the aortic valves, and as the child was a blonde, the capillary pulse was particularly well seen. Compensation had been good, but was now beginning to fail, causing the symptoms above mentioned. Digitalis and strychnine put the boy into very good condition, and after a few visits I did not see him any more till May 28, same year. This time he was complaining of stiffness and pain on walking, in left knee. Examination revealed nothing except the stiffness, which was only slight. On June 21 I was again called for the same trouble, and this time a small pulsating tumor could be felt in the popliteal space, which could be easily diagnosticated as an aneurism. I could get no history of any injury to the knee or leg of any kind. In the three weeks the tumor had enlarged considerably, and the pulsations could easily be seen across the room. There was now a great deal of pain, and the boy could only with difficulty bend the knee. On account of the pain and the great danger of a sudden rupture of the sac, I decided on an operation, although it was doubtful if his heart would withstand the shock. He was removed to the White Plains Hospital on July 17, and on the nineteenth I cut down on the tumor, isolated the sac, ligated it above and below, and removed it. Considerably more time was consumed in removing the aneurismal sac than was anticipated on account of the intimate adhesion to the surrounding structures and the thinness of the sac wall, which the slightest prick would have perforated. It is interesting to note that in spite of the grave condition of the heart and the weak physical condition of the boy, he took chloroform without the slightest difficulty. He was under the anesthetic one hour. The aneurism is of the sacculated variety, arising from the posterior wall of the popliteal artery, just behind the posterior ligament of the joint. Its size is about that of a large walnut.

The lad made a rapid recovery as far as the field of operation is concerned, and he regained perfect use of the limb.

I record this interesting case on account of the great rarity of aneurism in the young. Until a short while ago only twelve cases of aneurism had been reported in children below the age of fourteen years.

ARTIFICIAL FEEDING OF INFANTS.

By G. E. Decker, M.D., of Davenport, Iowa.

In studying the problem of infant feeding it may be taken for granted that in the healthy milk of a healthy mother, nature has provided a perfect food for the infant. Lacking this food it must be apparent that a substitute resembling mother's milk as closely as possible should be provided. Cow's milk for many reasons is the most practical basis for a substitute food, and in order to understand its use as such, the differences that exist between it and human milk must be borne in mind. Briefly stated they are as follows:

The fat per cent in both is nearly the same, three and a half or four. The sugar per cent in the human milk is six and a half to seven. In cow's milk it is about four.

The proteid per cent of human milk is one and a half to two, in cow's milk about four. Moreover in human milk the proteid is composed of lactalbumen or whey proteid about two-thirds, and caseinogen one-third, while in cow's milk the caseinogen forms four-fifths of the total. This explains the easier digestibility and smaller curds of human milk as compared to cow's milk. Another important difference is that while the human milk is practically germ free, even the best and cleanest cow's milk contains thousands of micro-organisms to a cubic centimeter.

Thus the food elements of the two milks are the same, but the proportions differ, and to such an extent that some rearrangement or modification of the cow's milk is necessary before it can be a fit substitute for the natural food.

Simple dilution with varying amounts of water is as incorrect in theory as it generally proves in practice, since the water dilutes all the elements equally, and when the proteid is sufficiently reduced for the infant's digestion, the fat and sugar are so diluted as to be entirely insufficient for nutrition. Hence, it is necessary to add to the sugar and fat while reducing the proteid.

The use of cream of various percentages and sugar of milk solution as a diluent simplifies the problem. Cream may be regarded as milk with an excess of fat, since it is found that the other constituents vary but little except in the high per cent creams. In fact, we may speak of whole milk as a four per cent cream. The use of whey, which contains about one per cent of lactalbumen and nearly all the sugar and salts of the milk, is often advantageous when there is trouble in the digestion of the proteid.

The difficulty lies mainly in the calculation of the amounts of milk, cream, sugar, etc., which are necessary to give the desired proportion in a given case.

The approximate percentage composition of the milk and cream used must first be known, as well as the quantity requisite for the twenty-four hours. A simple method, and one which is accurate enough for cases when the digestion is normal, is as follows:

A twelve per cent cream in which the proteid is to the fat as one is to three, is diluted with three, four or five parts of an eight per cent sugar of milk solution, which gives a fat per cent of three, two and a half and two, and a proteid per cent of one, eight-tenths and six-tenths respectively, with the sugar about seven per cent in each. The use of a sixteen per cent cream in the same way would give the ratio of proteid to fat as one is to four.

But there are many cases needing a more exact adjustment of percentages, especially those cases which have difficulty in digesting the proteids. In these a very slight variation may cause serious digestive trouble, and when a suitable mixture has been found, it must be carefully adhered to for some time and then only cautiously altered.

The working formulæ published in the *International Clinics*, Vol. III, tenth series, by Thompson S. Wescott, and reproduced also by Rotch, in the last edition of his *Pediatrics*, make is possible to obtain the most minute variations in any of the percentages by means of very simple calculations when once the formulæ have been mastered. Lack of space forbids the reproduction here of the formulæ and the considerable explanatory matter which must necessarily accompany them, but they may be readily found by any one interested.

The use of whey as a diluent of high percentage creams enables us to furnish a relatively high per cent of lactalbumen in proportion to the total proteid, thus making an easily digested mixture when the proteid digestion is at fault.

The indications for changes of the mixture in individual cases are doubtless clear enough. Frequent loose stools generally indicate too high a percentage of fat, diarrhea or constipation with undigested curds in the stools, too much casein, and a failure to gain in weight, either an insufficiency of the diet or failure in its digestion. These and other indications will occur to every one and must be promptly met by suitable changes in mixture, just as changes in the conditions of older patients are combatted by careful adjustment and alteration of the remedies employed. There can be no "favorite prescription" of modified milk, each infant being a law unto itself in regard to its nourishment. With this fact always in mind percentage feeding must become more and more popular as, indeed, it has since its first elucidation by Rotch in 1890.

In regard to boiling or Pasteurizing the mixture, it may be said that in winter and the cooler months, if the milk can be obtained from a clean source, neither is necessary. In summer it certainly is safe to Pasteurize the milk if it can be done, or to boil it if for any reason Pasteurizing is difficult or impossible to manage.

It is sometimes urged as an objection to percentage feeding that unless one has a milk laboratory to prepare the milk the process is too complicated and cannot be carried out in the ordinary home. With just as much reason it might be said that without hospital facilities we should not undertake to treat typhoid or perform a major surgical operation. Any intelligent mother can prepare a milk and cream mixture according to the physician's directions, and the extra time spent is well invested if the resultant infant is healthy and easily cared for. Even among the lower classes, where bottle babies are almost always incorrectly fed, it is easier to approximate a correct diet by ordering a suitable milk and cream mixture than by sanctioning some proprietary food or milk diluted with water. The directions may not be followed very closely by the mother, but this is true in whatever she prepares, and the chances are that a theoretically correct mixture will come out as well as any other.

The mistake most commonly made in substitute feeding is to give the infant too strong a mixture, that is making the percentages too high. It is especially hard to convince a mother that her baby will do better on a dilute food which it can digest than on a more concentrated one, which overtaxes the digestion. It is always safe to start with the percentages too low rather than too high, and later to increase them as the child gives evidence of satisfactory digestion. They should not be increased much above those of the human milk before the tenth or twelfth month; after that the child can gradually be brought to take whole milk, which should constitute the bulk of its diet during the second year.

The quantity to be given at a feeding also needs careful consideration, since over-feeding in this regard is a prolific source of vomiting and indigestion. It is quite a common thing to find that a child a few weeks old is given a large bottle full of milk and allowed and encouraged to take all it possibly can. Thus the stomach becomes gradually dilated, often to an extreme degree, and nutrition sadly interfered with. At birth the capacity of the stomach is an ounce or an ounce and a half, gradually increasing to six ounces at six months and eight to ten ounces at one year.

The interval between feedings should never be shorter than two hours in the first few months, and three to three and a half hours in the later months of the first year. There is a widespread belief among mothers and nurses that hunger is the cause of the baby's crying and fretting and that more food is the remedy. Consequently the child is fed oftener and oftener as its discomfort increases, and the difficulty augmented and perpetuated.

Finally, it must be remembered that a baby is not a machine and cannot be treated as such. Its needs vary with its development and its environment, and its successful feeding depends on watchful attention to details, no matter how trivial, so that changed conditions may be met by suitable changes in its diet. Cow's milk suitably modified for each individual case affords the best substitute for mother's milk, and in pediatrics as in other branches of medicine the plan that is correct in theory generally works out satisfactorily in practice.

RECENT STUDIES REGARDING THE MORPHOLOGY OF THE DIPHTHERIA BACILLUS.[1]

By Arthur T. Laird, M.D.

From the Bender Hygienic Laboratory, Albany, N. Y.

The morphology of the diphtheria bacillus is a subject which concerns every physician. The organism has been proven to be the cause of diphtheria. By a study of cultures from the throat, and the recognition of the diphtheria bacillus by its morphological characteristics, the diagnosis is often aided, and quarantine is imposed and regulated by Boards of Health in accordance with these cultural findings.

Diphtheria may be considered as the reaction of the body to the toxins produced by the diphtheria bacillus. This reaction is not necessarily along fixed clinical lines. All gradations of systematic poisoning may be recognized. The anatomical conditions produced also vary. The relation of the various common types of sore throat to each other under the older and newer conceptions of the disease has been well shown by Hill.

Older Anatomical Classification.	*Classification on Basis of Cause.*
Membrane=Diphtheria.	Membrane due to diphtheria bacillus toxins=Diphtheria.
	Membrane not due to diphtheria bacillus toxins=Not diphtheria.
Exudate=Follicular tonsilitis.	Exudate due to diphtheria bacillus toxins=Diphtheria.
	Exudate not due to diphtheria bacillus toxins=Not diphtheria.
No membrane or exudate=Simple sore throat.	Simple sore throat due to diphtheria bacillus toxins=Diphtheria.
	Simple sore throat not due to diphtheria bacillus toxins=Not diphtheria.

The bacillus may be present without forming toxins. The toxins may be produced and neutralized by body forces. The presence of the bacillus in cultures is not an absolute indicator of the activity of the toxins, but in the majority of cases if the bacillus is present it is producing toxins, and any symptoms the patient may have are due to the toxins.

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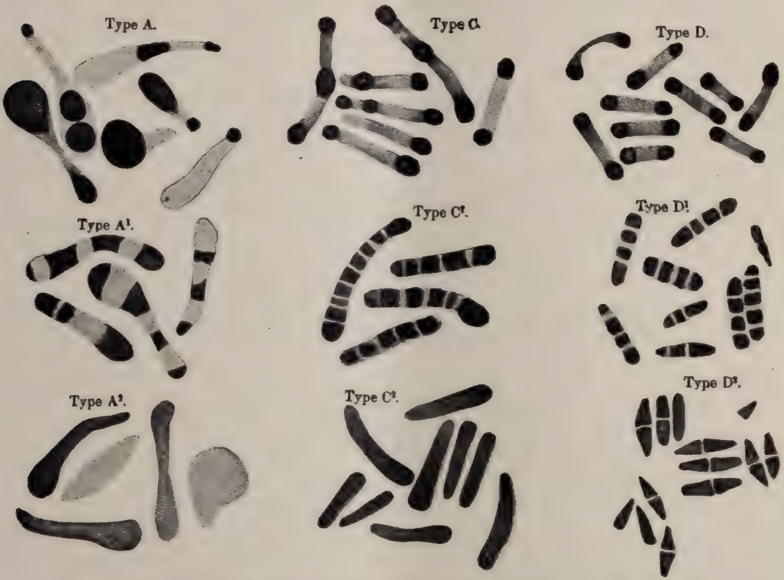
[1] Read before the Medical Society of the County of Albany, March 18, 1903.

The diphtheria bacillus is one of the few organisms which can be diagnosed from its morphological and staining properties alone. It has also definite cultural characteristics, and its virulence may be determined approximately by guinea-pig tests, but these methods of diagnosing diphtheria take too much time to be available for routine clinical work. The most striking peculiarities of the organism consist in certain variations of its form and staining properties.



The More Important Types of Diphtheria Bacilli According to Wesbrook's Classification.

(From Gorham, through the courtesy of the *Journal of Medical Research.*

Wesbrook,[2] Director of the Bacteriological Laboratory of the Minnesota State Board of Health, has been a leader in the study of the different forms of the diphtheria bacillus, and has suggested a convenient, though arbitrary method, of classification. He divides diphtheria bacilli into three main groups, subdivided into types. The groups (see plate) are: I. Granular; II. Barred; III. Solid-Color Forms.

I. Granular forms contain distinct spherical, ovoid, or markedly rounded granules, which usually show metachromatism, that is, they take a reddish tint with methylene blue. II. Barred forms show a distinct barred appearance, the number of subdivisions varying; usually they number from three to nine. III. Solid or evenly staining forms take a uniform tint with methylene blue. The subdivisions depending on shape and size are represented by the letters A to G. A, represents bizarre, irregularly-shaped, granular forms, the so-called involution forms. A^1 irregularly-shaped barred forms, and A^2 solid color forms, having the same characteristics as A and A^1 in regard to outline and size. Type C is more uniform in dimensions, and is the common long form of diphtheria basillus usually met with in clinical cases. D and E are similar but shorter. C^1, D^1 and E^1 resemble the organisms usually described as Xerosis bacilli. D^2, the so-called "atypical" form, resembles the organism called the pseudo-diphtheria bacillus. It is occasionally the only form present in clinical cases and, according to Wesbrook, is frequently pathogenic for guinea-pigs. A few of the more common of the above types are represented in the plate.

An analysis[3] was made of the distribution of types of bacillus diphtheria in 608 cases in which a diagnosis of "Diphtheria" was made in the Minnesota State Laboratory during the fourteen months ending December 31, 1900. Type A was found in one per cent of cases, D or C in eighty-nine per cent, E in two per cent, C^1, D^1 in three per cent, D^2, E^2 in five per cent. Among others, the following conclusions are drawn by Wesbrook. Type D appears to be the most important from a diagnostic standpoint. Type C is most frequently combined with type C^1. D^2 and E^2 are sometimes the sole diphtheria-like bacilli present in clinical cases, and should be considered sufficient evidence for isolating the patient. From a study of a series of clinical cases (2) the conclusion is drawn that (a) granular types are usually the predominant forms at the outset of the disease (b) the granular type usually gives place wholly, or in part, to the barred and solid types shortly before the disappearance of the diphtheria-like organism. On the other hand solid types may occasionally be replaced by granular types.

Gorham,[4] of Providence, in the examination of 2,375 cultures, about 1,000 of them from healthy subjects, verifies Wesbrook's observations, and concludes: (1) That diphtheria-like bacilli are more frequent in the nose than in the throat. (2) That there are diphtheria-like bacilli in the noses and throats of a large percentage of apparently healthy people. (3) That many morphological varieties of the B. diphtheriæ may be recognized. (4) That the change from granular or barred types to solid staining types seems to take place under the influence of the body fluids of a person immune or becoming so. (5) That the virulence of the B. diphtheriæ seems to be correlated with its microscopic form. (6) That the so-called Xerosis, Pseudo-diphtheria or Hofman's bacilli are morphological varieties of the B. diphtheria, sometimes capable of producing clinical diphtheria, but usually nonpathogenic to guinea-pigs. (7) That it is probable that the solid staining types may regain their virulence when they have once lost it.

The relationship of virulent diphtheria bacilli to non-virulent diphtheria-like bacilli has been discussed since Löffler in 1887, and von Hofman-Wellenhof in 1888 published descriptions of the pseudo-diphtheria bacillus. Dr. Anna W. Williams[5] sums up in tabulated form the results of numerous studies by various observers on this subject. Diphtheria-like bacilli have been found in a great variety of pathological conditions, apparently having no relation to clinical diphtheria. Some of these organisms have been said to be characterized by certain cultural and morphological peculiarities different from those of the diphtheria bacillus, and to constitute a distinct species. Park and Beebe[6] limited the name pseudo-diphtheria bacillus to such organisms, excluding bacilli which differ from typical diphtheria bacilli only in being non-virulent. These they considered diphtheria bacilli which had lost their virulence. Trump,[7] in 1896, and Richmond and Salter,[8] in 1898-1899, state that they have converted typical pseudo-diphtheria bacilli into typical diphtheria bacilli, specifically virulent for guinea-pigs by passage through guinea-pigs and goldfinches. Bergey[9] and others have not succeeded in giving virulence to non-virulent forms. Dr. Williams,[5] as a result of studies in New York City, at the Willard Parker Hospital for contagious diseases, and elsewhere, believes that there are distinct species and subvarieties of diphtheria-like bacilli which have no tendency to become converted one into the other. As many non-virulent diphtheria organisms retain their characteristics under various artificial and natural conditions she thinks that they may be regarded from a public health standpoint as harmless. She also concludes that the morphologically typical diphtheria bacillus is a distinct species from the atypical diphtheria-like bacilli and so-called pseudo forms. Morphologically the organisms described as pseudo-diphtheria bacilli have resembled the solid color types of B. diphtheriæ in Wesbrook's scheme, especially D^2. The so-called Xerosis bacilli resemble the barred forms.

In this connection the recent studies of Hill and Rickards[10] [11] regarding the mode of fission and reproduction of various organisms are of especial interest. Hill devised a method for the examination of living bacteria, substituting for the ordinary hanging drop a cube of solidified agar, on the surface of which the bacteria are sown. The inoculated surface of this cube is applied to the under surface of a cover-slip and examined under the microscope. Expedients are used to keep the preparation at a constant temperature. By means of this "hanging block" method it was found that a striking difference exists between diphtheria-like bacilli and a very large group of bacilli distinct from the diphtheroid group, in the movements taking place after fission.

What is usually observed in the bacilli of the diphtheroid group, including the diphtheria, pseudo-diphtheria and Xerosis bacilli is a gradual enlargement of the bacterial cell in both diameters, then a sudden snapping across of the rod, resulting in two portions lying at an angle with each other. Subsequently the gradual approximation of the distal ends of these rods results in a parallel arrangement, the so-called cord wood, palisade, or battalion arrangement. Both the angular and parellel grouping have long been observed in diphtheria cultures. In many bacilli, of which the typhoid bacillus may be considered the type, the post-fission movements take place in a manner quite different from that just described. After a sharp division without snapping, the proximal ends of the new bacilli slip past each other and gradually reach to the distal ends. In this form of division the proximal end of each of the new bacilli comes to be near the distal end of the other, while in the diphtheroid group the proximal ends remain close together. Hill believes that the snapping post-fission movements sharply distinguish bacillus diphtheria, bacillus pseudodiphtheria and bacillus xerosis from other bacilli of which the typhoid bacillus is typical, including the bacillus coli, bacillus pestis, bacillus pyocyaneus, bacillus anthrax, spirillum choleræ Asiaticæ, in all of which "slipping," rather than "snapping," movements were observed.

Denny,[12] of Brookline, Mass., has studied cultures of bacillus diphtheria, bacillus pseudo-diphtheria and bacillus xerosis, beginning to observe them within a few hours of the inoculation before visible growth appeared, and repeating the examination of the same culture at intervals. He found that in young cultures up to eight to twelve hours, the development of the diphtheria bacillus consists in elongation and fission. The bacilli stain evenly (C^2 D^2). After this fission ceases and changes take place in the individual organisms; granules develop, the rods elongate, the protoplasms break up into segments (bars), and branching may occur, all of which changes are characteristic of the higher bacteria, and especially of the streptothrix. If grown at room temperature the changes are retarded, the solid color stage lasts longer and granules do not appear until after forty-eight hours. A temperature of forty degrees C. also delays the appearance of the granules. Marked acidity or alkalinity of the serum prolongs the solid staining stage. If many staphylococci are grown with the diphtheria bacilli, the appearance of the granules is delayed.

The bacillus pseudo-diphtheria, Denny found to be in all stages like the young forms of bacillus diphtheria. It has no stage of development when it grows out into long forms like the higher bacteria. The bacilli were even shorter in old than in young cultures. Bacillus Xerosis: In young cultures the forms were like young diphtheria bacilli; older cultures became barred, only rarely did granules appear.

Hill[10 13 14] has studied cultures of the diphtheria bacilli in which branching occurs, both in stained specimens and by means of the "hanging block." He believes that branching may take place as a part of the active development of the diphtheria bacillus. Branching forms occur only in occasional cultures. They have been noted in several cultures received at the Bender Laboratory during the past year. It is probable that if a definite search for branching forms were carried out in every positive culture received in the laboratory they would be found in a larger percentage of cases. Wilson[15] found them more abundant in Boston than in Minnesota. The advisability of giving the name streptothrix or myco-bacterium to the diphtheria organism, or of placing branched bacteria in a class distinct from forms not yet known as branching seems to Hill to be questionable.

The studies of Hill and Denny seem to them to show that the so-called pseudo-diphtheria bacilli cannot be distinguished morphologically from young diphtheria bacilli, and it is probable that they are very closely related species.

A committee of the Massachusetts Association of Boards of Health has endeavored to collect data regarding the occurrence of diphtheria bacilli in well persons. The co-operation of leading bacteriologists, both within and without the State, was secured. A report was given at the April quarterly meeting, 1902.[15]

Wesbrook's plates were furnished to all the workers. Cultures were taken from both the nose and the throat, amounting to over 4,000 in number. It was found that between one and two per cent of persons examined in the east were infected with typical diphtheria bacilli of the granular types A, C and D. Solid color types were found in about twenty-six per cent of cases in the nose, and in about five per cent of cases in the throat. The results in Minnesota of cultures taken almost altogether from children in institutions where diphtheria had existed from one to eighteen months previously, showed a higher degree of prevalence of all the forms.

The committee believes that in healthy persons only the granular types A, C and D should be considered as diphtheria bacilli. Forty-seven tests of the virulence of granular forms found in throats of healthy people were made. Only about seventeen per cent proved to be virulent.

The committee concludes: I. It is impracticable to isolate well persons infected with diphtheria bacilli if such persons have not so far as known been recently exposed to the disease. II. It is not advisable as a matter of routine to isolate from the public *all* the well persons in infected families, schools and institutions, cultures from whom show the presence of the diphtheria bacillus.

The committee believes that the danger from an infected healthy person depends on the age, habits, surroundings, occupation and intelligence of the individual, and all of these matters should be taken into consideration by the health authorities.

Dr. Wesbrook modifies his assent to conclusion II. as follows: It may sometimes be impracticable to isolate from the public all the well persons in infected families, schools and institutions, though it should be done as a routine if at all possible.

From July, 1901, to date, the various types of diphtheria bacilli observed in positive cultures received at the Bender Laboratory have been noted according to Wesbrook's scheme. The cultures were examined for the Albany and Schenectady Boards of Health, and for the State Department of Health. The following table shows the relative frequency of occurrence of the granular, barred and solid color groups in cultures received for diagnosis and for release from quarantine. Under the heading "Granular" are grouped all cultures which showed the presence of granules in the bacilli. Many of these cultures contained also barred and solid color forms. The "barred" forms noted were found in cultures containing either barred forms alone ((these cultures were comparatively few in number), or barred and solid color forms. Solid color forms only were found in cultures recorded under that heading.

It will be seen that granular forms were found in more than half of the cases diagnosed as diphtheria. It will also be noted that in cultures for release from quarantine, solid color forms alone were found in a much larger proportion of cases than in cultures for diagnosis. This confirms the observations of Wesbrook[3] and Gorham,[4] that in the later stages of the disease the granular types are frequently replaced by solid color types. The release cultures include those taken from a day or two after the diagnosis up to the time that a culture free from the bacilli was obtained. It is possible that if only cultures taken just before release were included a larger proportion of solid color forms would have been obtained. On the other hand in individual cases we have found granular types persisting up to the final culture.

Of the types noted, C and D have been the most common among the granular forms, and C^2 and D^2 among the solid forms. Nearly all of the types have been seen.

The solid types have been found to be the only ones present in a considerable number of the clinical cases of diphtheria. This is thought by the committee of the Massachusetts Board of Health[15] to be a very rare condition, but Wesbrook[3] and Gorham[4] have both found them present alone in cases of clinical diphtheria, and have several times isolated solid forms in pure cultures from healthy persons, and proved them virulent to guinea-pigs.

Since the appearance of granules may, according to Denny,[12] be delayed by several factors, temperature above forty degrees, marked alkalinity or acidity of serum, symbiosis with staphylococci, short incubation, etc., it is possible that some cultures classified under the solid color heading would have later shown granular forms. Two cultures showing solid color types only were laid aside for a day or two, and when examined again showed granular forms.

No constant difference was noted between the types found in cultures from Albany and Schenectady, or between types in cultures from different parts of the State.

Amyot, of Ontario,[15] states that the types vary with the locality to some extent, since in studying clinical cases bacteriologically he was able to distinguish between two specific localities by the types present.

Gorham[15] found that the types present in Providence in clinical diphtheria ran considerably smaller than those in Boston.

The table shows also the marked increase in the number of cases of diphtheria occurring after the opening of the schools.

The location of cases occurring in different school districts in Albany is now marked on a map kept at the laboratory.

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[1] Hill, H. W. Interpretation of Bacteriological Findings in Diphtheria Diagnosis. Boston Medical and Surgical Journal, March 7, 1901.

[2] Wesbrook, Wilson and McDaniel. Varieties of *Bacillus Diphtheriae.* Transactions of the Association of American Physicians, 1900. Biennial Report of Minnesota State Board of Health, 1899-1900.

[3] Wesbrook, Wilson and McDaniel. Analysis of the Distribution of Types of B. Diphtheriae in 608 cases in which a diagnosis of "Diphtheria" was made in the Laboratory for the fourteen months ending December 31, 1900. Biennial Report of Minnesota State Board of Health, 1899-1900.

[4] Gorham, F. P. Morphological Varieties of *Bacillus diphtheriae.* Journal of Medical Research, July, 1901.

[5] Williams, Anna W. Persistence of Varieties of the *Bacillus diphtheriae* and Diphtheria-like Bacilli. Journal of Medical Research, June, 1902.

[6] Park and Beebe. Scientific Bulletin No. 1, Health Department, City of New York, 1895. (Quoted in 5.)

[7] Trump. Centralbl. f. Bakt. xx. Bd., 1896, p. 72. (Quoted in 5.)

[8] Salter. Transactions Jenner Institute of Preventive Medicine, 1899.

[9] Bergey. Pub. of Univ. Penn. New Series No. 4, 1898.

[10] Hill, H. W. Notes on the Morphology of *Bacillus diphtheriae.* Annual Report of Boston Board of Health, 1901.

[11] Hill and Rickards. Notes on Morphology. Transactions of American Public Health Association. Vol. xxviii.

[12] Denny, F. P. Observations on the Morphology of *Bacillus diphtheriae, Bacillus pseudo-diphtheriae* and *Bacillus xerosis.* Journal of Medical Research, March, 1903.

[13] Hill, H. W. Branching Forms of *Bacillus diphtheriae.* Journal of the Boston Society of Medical Sciences, January, 1899.

[14] Hill, H. W. Branching in Bacteria with Special Reference to *Bacillus diphtheriae.* Journal of Medical Research, January, 1902.

[15] Report on Diphtheria Bacilli in Well Persons. Journal of the Massachusetts Association of Boards of Health, July, 1902.

REPORT OF CASES OF FRACTURE IN THE SHAFT OF THE FEMUR[1]

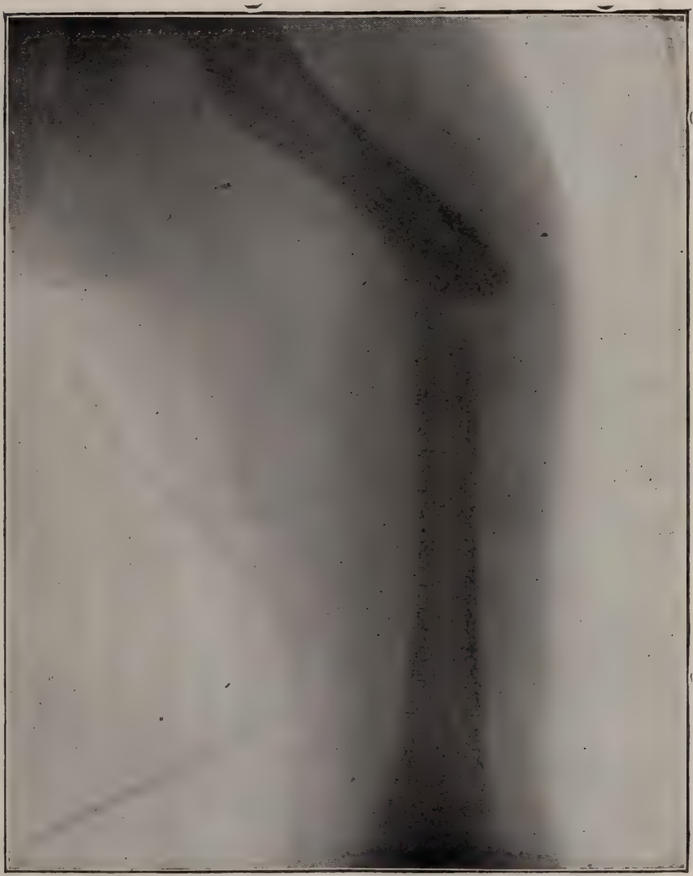
By I. B. Perkins, M.D., Denver, Colo.,

PROFESSOR OF CLINICAL GYNAECOLOGY, DENVER AND GROSS COLLEGE
OF MEDICINE; SURGEON AND GYNAECOLOGIST TO ST. LUKE'S
HOSPITAL; SURGEON TO ST. JOSEPH'S HOSPITAL;
GYNAECOLOGIST TO ARAPAHOE COUNTY HOSPITAL.

Case 1. C. W., boy, age six years. Healthy and of healthy parents. On the 22d of May, 1902, this patient, while swinging on a wagon, fell in such a way as to allow the wheel of another wagon to pass over his right thigh, fracturing it at or near the juncture of the middle and upper third. The fracture was oblique and possibly somewhat comminuted. The displacement of the upper fragment was forward and outward. The lower fragment was drawn upward two inches and was displaced backward and inward. Marked outward angular deformity was present. An anæsthetic was given and the fracture was reduced. The limb was surrounded at the point of fracture with short light splints, held in position by a roller bandage. A long side splint was then applied. The foot and limb below the knee were elevated by the use of pillows and extension by means of weight and pulley was applied, the pulley being placed high, so as to give, in a measure, the effect of the inclined plane.

It was extremely difficult to keep the patient quiet; in fact, it was impossible to do so. He would turn from side to side, and often successfully prevail upon different members of the family to place the weight in a chair, thereby giving the limb temporary rest from extension. Notwithstanding the difficulties encountered, by the 29th of June there appeared to be fairly good union, though the callous was large and was thought to be soft. At this time an anesthetic was given and a plaster cast was applied to the limb down to the knee, extension being made during the application of the cast. A few days later the boy turned over on his stomach and otherwise threw himself about in bed. I found him with the cast slipped down and the callus broken loose. There was a decided angle forward and outward in the bone.

On July 8 the cast was removed, the patient was anesthetised and an X-ray picture (No. 1) was taken by Dr. Childs. While yet under the anesthetic, the limb was straightened down by strong traction, and an effort to get the bone again in position was made and another cast was applied, extension being made during



No. 1

C. W., aged six. Fracture of right femur. Skiagraph taken eight weeks after injury. Lateral view. Fracture not united, but showing callus.

the application and setting of the cast. He was kept in bed and the extension was kept on as best we could.

Picture No. 2 was then taken through the cast. Picture No. 1 shows very clearly, by the irregular surfaces, the second breaking, or rather the breaking and tearing of the soft callus.

Picture No. 2, as you see, shows considerable improvement over the first one, but is still very unsatisfactory. Dr. G. B. Packard saw the case in consultation at this time, and it was decided to apply a long extension hip splint, such as is generally used in hip joint diseases. This was done under anesthesia after the fragments had been manipulated and gotten into as good a position as was possible. The limb was then placed on an inclined plane and extension was made by means of the key, and the patient was removed to the hospital and kept in bed. He complained of pain from pressure of the perineal strap, and in order to relieve this without lessening the extension, weights were attached to the end of the splint and allowed to swing from a pulley. Patient was kept in bed for six weeks, after which he was allowed to walk about, putting his weight on the splint. A few days later the splint was removed and he was allowed to walk without artificial means. The functional result is all that could be asked, and the anatomical result is fairly good, as is shown by cuts 3 and 4. The measurements show practically no shortening. The patient is here and I shall be glad to have any who may desire to do so examine and measure the limb.

Case 2. G. S., a girl of six years; healthy and of healthy parents. The following history was obtained from the parents: "On the thirteenth of July, 1902, while visiting in the mountains and while trying to climb into a wagon that was in motion, patient's foot was caught in the wheel in such a way as to fracture the left femur. The fracture occurred below the middle of the bone and was comminuted. One sharp fragment stuck almost through the skin, all but producing a compound fracture.

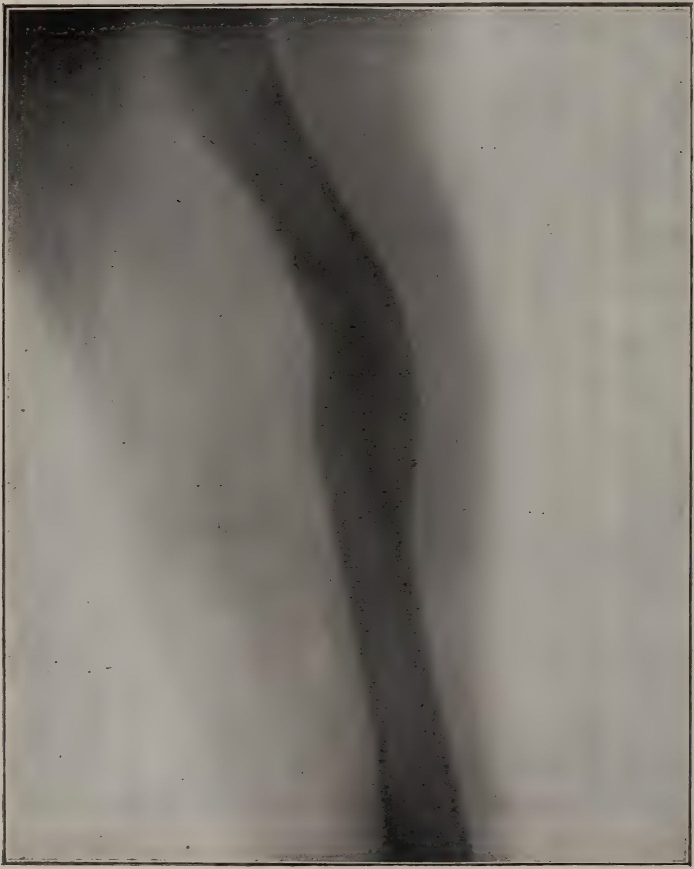
"The attending physician applied side splints of cardboard. On the third day these were removed and plaster of paris was applied. A week later, which was ten days after the accident, she was given crutches and allowed to walk, but instructed not to put any weight on the left foot. At the end of the second week the cast was cut off and fixed so that it could be laced on again, and the fracture was examined. It was replaced and allowed to remain one week, being three weeks from date of injury. At the end of this time we were advised to bring her to Denver."

No. II

C. W., aged six. Fracture of right femur. Skiagraph taken eight weeks after injury. Lateral view through plaster paris cast. Partial reduction.

On my first examination it was found that the callous was very large and there was marked outward and forward angular deformity, more than two inches of shortening, with no union at all in the bones.

I regret that an X-ray picture of this case was not taken before operation, but if in your examination of cut No. I, of the case just reported, you imagine the under fragment drawn up and the fragments overlapping each other at least two inches with a broad, flat callus at the end of each fragment, you will have a fairly



No. III

C. W., aged seven. Fracture of right femur. Firm union. Skiagraph taken ten months after injury. Lateral view.

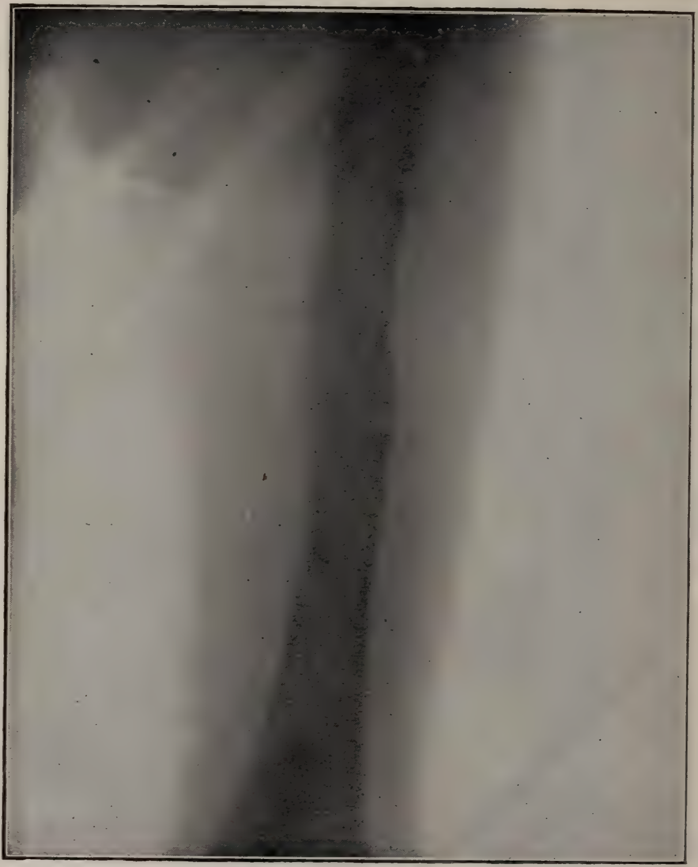
correct picture of the case. Drs. Packard and J. M. Perkins, who were with me in the case, will bear me out in this statement. An anesthetic was given and an attempt at reduction was made. This could not be accomplished, owing chiefly to the large callus at the ends of the bones. Patient was put to bed for several days with limb on an inclined plane and was treated with weight and pulley. This failed to make any difference in the length of the limb, and operative treatment was decided upon. On the ninth day of August she was operated upon. An incision was made over the point of fracture and a number of small fragments of bone, together with considerable callus which held them together, were removed. The ends of the bone, which were sharp and irregular, were freshened and the two fragments of bone were wired together with medium sized silver wire. Two holes were drilled in each fragment and two loops of wire were used. In this, as in the previous case, the functional result is fine and the anatomical result, as shown by cut No. 5, is likewise quite satisfactory. By measuring this patient, who is also here to-night, you will find no appreciable difference in the length of the limbs. These children are both romping, healthy specimens, and appear to have no need for better limbs than those they now possess.

X-RAY REPORT OF ABOVE CASES

By S. B. Childs, A.B., M.D., Denver, Colo.

PROFESSOR OF ANATOMY, DENVER AND GROSS COLLEGE OF MEDICINE;
SURGEON TO THE MERCY SANITARIUM.

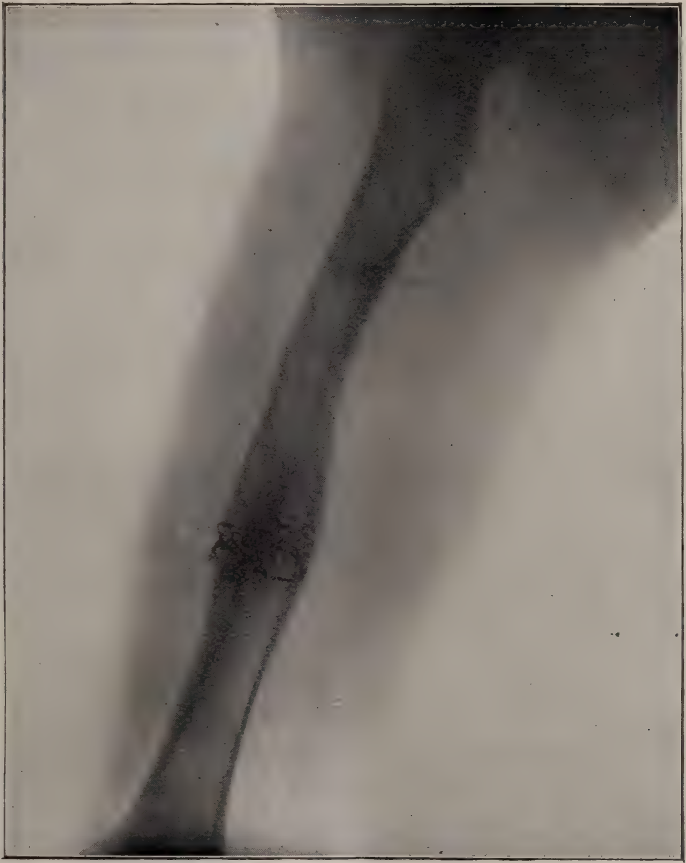
A skiagraph shows the shadows cast upon a photographic plate by the denser structures with which the X-rays come in contact and requires that the rays have sufficient penetration to pass through the area and be capable of outlining the shadows upon a fluorescent screen. As these rays diverge from the anode of the tube it is absolutely essential for the correct representation of the existing relations of the parts in question, that the target be accurately focused over the exact seat of suspected fracture or injury and that the central rays strike the object and the X-ray plate at a right angle. Having taken these precautions in adjusting the tube and having placed it a sufficient distance from the plate to prevent magnifying the structures, we can depend upon the skiagraph for a practically accurate representation of the flat relations of the parts examined. It is the lack of attention to these details that has thrown discredit upon the reliability of certain skiagraphs; it is not the fault of the X-ray, it is entirely the fault of the X-ray operator.



No. IV

C. W., aged seven. Fracture of right femur. Firm union. Skiagraph taken ten months after injury. Antero-posterior view.

As it requires some experience to interpret properly the significance of the different shadings found in an X-ray picture, I take the liberty of briefly explaining the skiagraphs in the order in which they are enumerated.



No. V.

A. G. S., aged six. Fracture of left femur. Fragments wired. Firm union. Skiagraph taken eight months after injury. Lateral view.

No. I shows the typical appearance of an oblique fracture of the upper third of the femur and is a lateral view of the first case reported by Dr. Perkins. The lower fragment is usually drawn up behind the upper by the action of the hamstrings, rectus, tensor vaginæ femoris and the adductors, the latter group being chiefly instrumental in carrying it to the inner side. The lower end of the upper fragment is tilted forward and outward by the pushing up of the lower fragment assisted by the action of the iliopsoas muscle, thus producing an angular deformity. The angular deformity in this case is well marked. We notice that the intervening space between the fragments is filled by a shadow of less density than the bones, but greater than that of the muscles, and in this shadow we see several much lighter spots. The first shadow referred to represents the callus which nature had so lavishly poured out for the repair of the bones, and the lighter spots represent the solution of continuity of the same, produced by movements of the fragments; so that at the time of taking the picture, eight weeks after the reception of the original injury, despite the liberal amount of callus the fracture was still ununited.

No. II was taken a few minutes later than No. I, the X-ray tube maintaining the same relative position and represents the appearance of the fragments after reduction had been attempted by extension and manipulation under complete anesthesia and the leg had been put up in a firm plaster Paris cast. The angular displacement had been considerably reduced, but the wedge of callus which can be seen between the fragments prevented their complete approximation.

Nos. III and IV represent the condition of the bones at the present time, eight months after the first skiagraphs were taken, No. III being the lateral and IV the antero-posterior view. By tracing the lighter shading of the medullary canal in No. III we can see approximately the ends of our fragments, but the intervening space is filled by a dense shadow without the medullary canal and represents the permanent callus which has so firmly united the bones and, by spanning the gap, has prevented the shortening which is apt to follow a fracture in this locality.

No. IV shows a good lateral approximation of the fragments, although the slight inner displacement of the lower and the outer displacement of the upper can be perceived. This last skiagraph gives no intimation of the angular position at which union has taken place and illustrates in a very practical manner the advisability of inspecting both the lateral and antero-posterior axis in all cases in which an X-ray examination is made.

No. V is a lateral view of the thigh described in the second case reported, and represents the condition of the femur seven months after the operation of wiring the fragments, the silver wires being plainly visible and the vertical axis of the shaft of the bone apparently normal. We can see the medullary canal in the upper and lower part of the bone and notice the denser shadow of the bridge of permanent callus.

The X-ray has established itself as a necessity in making an accurate and positive diagnosis in many of the lesions of the body, especially the localization of foreign bodies and obscure fractures. By the aid of the rays the surgeon is enabled to inspect the position of the fragments after the application of a temporary or permanent dressing, for the ordinary materials used in these dressings, such as wood or plaster, afford no barrier to the penetration of the rays. It saves the patient from the pain and discomfort incident to undue manipulation of structures which have already been contused and lacerated and especially enables a correct diagnosis to be made in the edematous condition which soon supervenes upon some fractures, and which excludes a positive diagnosis by the ordinary methods until after a considerable lapse of time. The more the X-ray is used in diagnosis in injuries in the neighborhood of joints the more rare will become the bad results from so-called sprains and the less often will the attending physician or surgeon fail to notify the patient or the family that an apparently trifling injury may result in permanent crippling of the joint.

SOCIETY PROCEEDINGS

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN

On Saturday, June 20, the Provincial meeting of the above society was held at the Alexandra Hospital for Sick Children, Brighton, Dr. Wayland C. Chaffey in the chair.

Is the Urban Hospital Treatment of External or Surgical Tuberculosis Justifiable?—Mr. A. H. Tubby read a paper with the above title, stating that he had examined the statistics of four hospitals for children's diseases in London in order to see whether the results of operations on tuberculous joints or glands of the neck were satisfactory. Of 218 cases, 68 were cured, 128 relieved, 9 died in hospital, and in the remaining 13 the result was unknown. It was pointed out, however, that the word "relieved" was of doubtful significance and, when applied to tuberculous affections, meant little or nothing. It was suggested that tuberculous children should not be treated in London hospitals, but in properly equipped establishments in the country or at the seaside. Mr. Clement Lucas and Dr. Sansom commented upon the paper, and Mr. Tubby replied. Mr. Clinton Dent said that the issue raised was of such importance that he thought a sub-committee should be appointed to consider the matter. Mr. Jaffrey seconded the proposal. The following gentlemen were appointed to serve on the sub-committee: Mr. Clinton Dent, Dr. Dawson Williams, Mr. Sydney Stephenson, Mr. Jaffrey and Mr. Tubby.

Tin Mouth Organ.—Mr. Clement Lucas then read a paper upon the removal of a tin mouth organ from the small intestine of a child aged three years. The chief interest lay, perhaps, in the localization by means of skiagraphy. In this case the metal body was situated in the upper part of the jejunum. Mr. Lucas compared various features of the case with those presented by another, which he had previously brought before the notice of the Society, when a large nail had been situated in the second part of the duodenum. Mr. Clinton Dent referred to an interesting case of his own that had given rise to some difficulty.

Children's Hospitals.—Dr. Edmund Hobhouse read a paper upon "The Functions of Children's Hospitals," and said that, although attached also to a general hospital, he thought his work at the children's hospital the most interesting and important of his medical life.

Cervical Glands.—Mr. R. H. Parry then read a paper and showed photographs of cases in which enlarged cervical glands had been removed through an incision in the hairy scalp. He had operated in this way upon twenty cases. Mr. Lucas, Mr. Morgan and Mr. Tubby commented upon the method.

Nephritis.—Dr. George Carpenter read a paper upon "Nephritis in a Syphilitic Infant," upon which Dr. Cautley and Dr. George Sutherland commented. Dr. Carpenter then read a paper upon "Splenomegaly in Infants," 348 cases of which had come under his notice; in only 66 could rickets or syphilis be definitely excluded.

Meningitis.—Dr. Edmund Cautley read a paper upon "Primary Pneumococci Meningitis." The child presented symptoms of meningitis, but no physical signs were present in the lungs. A diplococcus was obtained in cerebro-spinal fluid drawn off by lumbar puncture. The child recovered but died later in a fever hospital of diphtheria; but, unfortunately, permission for an autopsy could not be obtained. Dr. Theodore Fisher and Dr. George Sutherland spoke upon the case.

Carditis in Children.—Dr. Alexander Morrison read a paper upon "The Use of Opium in the Carditis of Children," and brief summaries of other cases quickly followed. They were upon "The Dilatation of the Bronchial Tubes After Measles," by Dr. Theodore Fisher; one of an obscure case of cerebral tumor, which for a time became quiescent, by Dr. Eldon Pratt, and another of considerable importance, by Dr. Sydney Stephenson, upon a condition of the optic papilla likely to be mistaken for optic papillitis. Beautiful drawings of the condition were passed round.

In the evening the members of the Society dined at the Grand Hotel, and the following day Dr. Wyland Chaffey entertained them at lunch at the Hotel Metropole.

PHILADELPHIA PEDIATRIC SOCIETY

Stated meeting of the Philadelphia Pediatric Society, Tuesday evening, June 9, 1903, the President,

Dr. D. J. Milton Miller, in the Chair.

Mitral Disease.—Dr. Francis W. Sinkler, by invitation, exhibited a boy of fourteen years, who had presented himself at the Medical Dispensary of the Episcopal Hospital with the statement that he had phthisis, and with the request that a certificate for admission to a sanitarium for tuberculous subjects be given to him.

He was found to be extremely cyanotic and dyspneic. He had a bulging precordia, systolic pulsation of the cervical veins, and a very widespread cardiac impulse. The cardiac dulness extended from about the right nipple line to near the left posterior axillary line, laterally, and from the second rib to the eighth rib. A strong double thrill was palpable over this area. The second pulmonary sound was not accentuated. There was a rough systolic murmur and also a slight diastolic one, and at the tricuspid area was another murmur, which was apparently individual. There was an ill-defined Broadbent's sign, and the cardiac dulness was apparently immobile on change of position. The lungs were congested, and there was an effusion in the right pleural cavity. The patient had no ascites or edema of the legs.

It was at first suspected that there were both mitral valvular disease and chronic adhesive pericarditis, because of the apparent Broadbent's sign, the immobility of the cardiac dulness and the extremely marked enlargement downward and to the left. With rest, the signs became much more distinctive, and seemed to be those of mitral stenosis and regurgitation. There are probably no pericardial adhesions.

The only history that apparently has any bearing upon the cardiac condition is that of two attacks of pneumonia occurring in 1901. Since these attacks the boy has always been cyanotic and dyspneic on slight exertion, and for a year he has been growing persistently worse. The pulmonary condition that led the boy to report as a case of tuberculosis was due entirely to congestion.

REPORT OF THE MILK COMMISSION OF THE PEDIATRIC SOCIETY.—Before reading the report, Dr. Hamill explained that a committee of the Keystone Veterinary Medical Society, in conjunction with a committee of the Pediatric Society's Milk Commission, had been requested to submit a report that afternoon to the Director of Public Health and Charities. Although the hour for this was before that of the meeting of the Pediatric Society, for which the report had been intended, it had been thought best to submit the report to the Director of Health at that time, and the Commission hoped that the Society would indorse the report that they had prepared. Dr. Hamill further stated that the report had been originally written for the Pediatric Society, and that he would read it as originally written. It was as follows:

Report of the Philadelphia Pediatric Society Milk Commission to the Pediatric Society, containing recommendations to the Department of Public Health for the Improvement of the Milk Supply of Philadelphia.

It is almost incomprehensible that the conditions under which the production, transportation and distribution of milk—the food of infants and invalids, and of a large percentage of people in all conditions of life—should have received so little consideration at the hands of our law-makers. The influence of a defective milk supply upon the infantile mortality is a matter of history; and yet, at the present day the laws that are supposed to protect the public from the dangers of a defective milk supply are totally inadequate, and these are inefficiently enforced.

MILK PERCENTAGES.—Dr. Thompson Westcott exhibited a mechanical device for almost instantaneously calculating milk-mixtures without using formulæ. The essential principle employed in this device is new, the proportions of cream and milk being expressed as definite fractional parts of the total quantity. In this way, any definite combination of fat and proteid percentages may always be expressed by the same simple fractional parts of total quantity; therefore this combination holds true, no matter what the total quantity may be, the quantities of milk and cream required being at once found by taking these fractional parts of the total quantity. By an ingenious arrangement of concentric discs, these fractions are immediately indicated for any fat and proteid formula. The quantity of sugar is also rapidly determined by a series of factors that are really decimal parts of the total quantity of mixture. One-fourth of the total quantity is simply multiplied by the corresponding sugar-factor and divided decimally by 100. By using this device and of the usual percentage-formulæ may be expressed in terms of the quantities of milk, cream and sugar, within a few seconds, thus entirely doing away with the usual tedious calculations by means of the algebraic formulæ now in use. A full description of the device and of the underlying principles will soon be published.

In the hope of improving dairy conditions, and to protect consumers against the dangers of an impure milk, this Society organized a Milk Commission in 1899. The requirements of this Commission, put briefly, are these: All dairies under the certification of the Commission, at least once each month, must submit to an inspection by a veterinarian appointed by the Commission. The duties of the veterinarian are to determine the state of health of the herd, the degree of cleanliness of the cows and the stables, the character of the food and water supply, the general precautions of cleanliness in the milking and the care of the milk. Once each year he must test the entire herd for tuberculosis, and see that all new cows admitted to the herd have satisfactorily passed the same test.

The milk and cream must be examined at least once each month by a chemist and a bacteriologist appointed by the Commission. The chemist determines the presence or absence of coloring matters, whether or not the milk has been pasteurized or sterilized, and the percentage of its different ingredients. The bacteriologist determines the number and nature of the bacteria present. All milks must contain less than 10,000 germs to each cubic centimeter, and be free from pathogenic forms. This number is lower than is required by any other commission in the country; and, when one considers that the ordinary market milks sometimes contain as many as 10,000,000 to each cubic centimeter, the character of this standard can be better appreciated.

The result of the Commission's work has been most gratifying. While a number of the dairies that have endeavored to comply with these requirements have failed, others have met them in a most satisfactory manner. This applies to all the dairies at present receiving the certification of the Commission, which are: The Walker-Gordon Dairies, of Plainsboro, New Jersey, with offices at 1721½ Chestnut Street (selling milk and cream); the Willowbrook Farms Dairies, of Jenkintown, Pa., with offices at Abbott's Alderney Dairies, Philadelphia (selling milk and cream); Haddon Farms Dairies, at Haddonfield, New Jersey, the product of which (milk only) is also sold by Abbott's Alderney Dairies, of Philadelphia; the Purity Milk Company, of Trenton, New Jersey, whose milk and cream are sold by F. A. Wills, Berks and Camac Streets, and by Supplee's Alderney Dairies, 1744 North Eleventh Street, Philadelphia. The products of two additional dairies are now pending examination for certification by the Commission. Each jar bearing the milk or cream from these dairies bears on its cap the name of the dairy in which it is produced, and under the cap is placed the certificate of the Philadelphia Pediatric Society Milk Commission. These certificates are granted for a period of one month, and are not renewed unless the dairy satisfactorily complies with all the requirements of the Commission.

The woeful condition of the general milk supply of this city, together with a knowledge of the valuable work that has been accomplished by our Commission, has led the present Director of Public Health, Dr. Edward Martin, to request this Commission to formulate a plan for the improvement of the general milk supply, and to obtain for such scheme the endorsement of this Society.

The existing laws and regulations, in abstract, are as follows: All milk shall contain, as a minimum, 3 per cent of fat and 12.50 per cent of total solids. It shall be free from preservatives and coloring matter. Any milk may be examined at any time in the laboratory of the Department of Public Health for the presence of streptococci and pus cells. Their presence is accepted as an indication of inflammation of the udder, and necessitates a veterinary inspection of the herd.

These regulations are carried out by an Inspector of Milk and a corps of assistants. Inspections are made at no fixed time, and examinations are required only when suspicious circumstances exist. This system of inspection doubtless has some beneficial effect in regulating dishonest methods, but it is in no sense adequate to protect the public against the dangers of unclean, carelessly transported, poorly preserved milks, which are handled by honest, but ignorant, producers and dealers.

After a careful consideration of all the difficulties attached to the proper regulation of the manner of production, transportation and distribution, your Commission is prepared to submit the following recommendations for your indorsement. We would recommend:

1. That all milk sellers be required to obtain a license, and that such license be granted free of charge.

2. That no license be issued unless the dealer is willing to state the source of his supply, and to give satisfactory evidence that the producer from whom he receives his milk maintains his herd and premises up to the standard prescribed by the Department of Public Health; the observance of such standard to be determined by periodic inspections under the direction of this same Department.

3. That the standard to be established should correspond closely or exactly with the list of fifty dairy rules recommended by the Bureau of Animal Industry of the United States Department of Agriculture, a copy of which is appended.

4. That dealers be required to remove all milk from the transportation trains immediately upon their arrival, unless in refrigerators, and to deliver the milk of the morning and previous evening on the day of its arrival, unless kept iced.

5. That dealers be required to have a special milk room, so situated in relation to their houses as not to be a thoroughfare; that its walls shall be tiled or painted with glazed paint; that its floors shall be made of hard wood, cement, or other composition, or that they shall be covered with linoleum; that the room shall be well ventilated and kept thoroughly clean.

6. That it be required that all milk wagons be thoroughly cleansed after each delivery, and that they be so constructed that thorough cleansing is possible; and that all utensils, such as dippers, etc., carried on the wagons, when not in use, be kept in separate, clean cans.

7. That no dealer or producer be permitted to deliver milk in bottles who has not on his premises satisfactory appliances for the proper cleansing and sterilization of bottles, and who does not properly use them.

8. That no dealer be permitted to fill bottles outside of his milk

room; and that dealers should be required to thoroughly cleanse and scald all milk cans before returning them to the producer.

In addition to the tests that are at present applied by the Inspectors of Milk, we would suggest:

(1.) That, in order to obtain some idea of the bacterial content of the milk, the degree of acidity of the milk be determined, and that all milk showing an acidity of more than 0.2 per cent be condemned.

(2.) That an examination by sedimentation be made to determine the amount of dirt present; and, if found in more than minimum quantity, that such milk be condemned.

We believe all of the above recommendations to be easily applied, absolutely essential, and, if properly carried out, capable of accomplishing great improvement in the quality of the ordinary market milks. Any dairyman or dealer that is incapable of meeting such requirements should not be permitted to produce or sell milk.

While we realize that a more rigid standard would be desirable from the standpoint of public health, we recognize the impracticability of attempting to establish such standard at the present time. We deem it advisable to approach the higher standard by gradual stages, insisting upon a strict enforcement of the moderate suggestions recommended.

It was then moved and seconded that Dr. Hamill be requested to read, also, the appended list of fifty printed rules prepared by Mr. R. A. Pearson, formerly one of the assistants in the Department of Agriculture at Washington. The motion was carried.

Dr. Hamill said that these rules are published by the Department, printed on cotton sheets, and that they may be had by any farmer that cares to apply for them. Certain of these rules are not absolutely essential, but the Commission had held a conference with a committee from the Keystone Veterinary Society, and especially with Dr. Leonard Pearson, before adopting any of the recommendations contained in the report or deciding upon this list of rules as desirable to control the various producers. Dr. Hamill then read the following list of rules of the Bureau of Animal Industry, Department of Agriculture:

The Owner and His Helpers.

1. Read current dairy literature and keep posted on new ideas.

2. Observe and enforce the utmost cleanliness about the cattle, their attendants, the stable, the dairy, and all utensils.

3. A person suffering from any disease, or who has been exposed to a contagious disease, must remain away from the cows and the milk.

The Stable.

4. Keep dairy cattle in a room or building by themselves. It is preferable to have no cellar below and no storage loft above.

5. Stables should be well ventilated, lighted and drained; they should have sound floors and walls and be plainly constructed.

6. Never use musty or dirty litter.

7. Allow no strong-smelling material in the stable for any length of time. Store the manure under cover outside the cow stable, and remove it to a distance as often as practicable.

8. Whitewash the stable once or twice a year; use landplaster in the manure-gutters daily.

9. Use no dry, dusty food just previous to milking; if fodder is dusty, sprinkle it before it is fed.

10. Clean and thoroughly air the stable an hour before milking; in hot weather, sprinkle the floor.

11. Keep the stable and dairy-room in good condition; and then insist that the dairy, factory, or place where the milk goes, be kept equally well.

The Cows.

12. Have the heard examined at least twice a year by a skilled veterinarian.

13. Promptly remove from the herd any animal suspected of being in bad health, and reject her milk. Never add an animal to the herd until certain it is free from disease, especially tuberculosis.

14. Do not move cows faster than a comfortable walk while on the way to place of milking or feeding.

15. Never allow the cows to be excited by hard driving, abuse, loud talking, or unnecessary disturbance; do not expose them to cold or storms.

16. Do not change the food suddenly.

17. Feed liberally, and use only fresh, palatable food-stuffs; in no case should decomposed or mouldy material be used.

18. Provide water in abundance; easy of access; and always fresh and pure, but not too cold.

19. Salt should always be accessible.

20. Do not allow any strong-flavored food, like garlic, cabbage and turnips to be eaten, except immediately after milking.

21. Clean the entire body of the cow daily. If hair in the region of the udder is not easily kept clean, it should be clipped.

22. Do not use the milk within twenty days before calving, nor for three to five days afterwards.

Milking.

23. The milker should be clean in all respects; he should not

use tobacco while milking; he should wash and dry his hands before milking.

24. The milker should wear a clean outer garment, used only when milking, and kept in a clean place at other times.

25. Brush the udder and surrounding parts just before milking; and wipe them with a clean, damp cloth or sponge.

26. Milk quietly, quickly, cleanly and thoroughly. Cows do not like unnecessary noise or delay. Commence milking at exactly the same hour every morning and evening, and milk the cows in the same order.

27. Throw away (but not on the floor; better, in the gutter) the first few streams from each teat; this milk is very watery and of little value, but it may injure the rest.

28. If, in milking, a part of the milk is bloody or stringy or unnatural in appearance, the whole mass should be rejected.

29. Milk with dry hands; never allow the hands to come in contact with the milk.

30. Do not allow dogs, cats or loafers to be around at milking time.

31. If any accident occurs, by which a pail full or partly full of milk becomes dirty, do not try to remedy this by straining; but reject all this milk and rinse the pail.

32. Weigh and record the milk given by each cow, if possible; and take a sample, morning and night, at least once a week, for testing by the fat-test.

Care of Milk.

33. Remove the milk of every cow at once from the stable to a clean, dry room, where the air is pure and sweet. Do not allow cans to remain in stables while they are being filled.

34. Strain the milk through a metal-gauze and a flannel-cloth or layer of cotton, as soon as it is drawn.

35. Aerate and cool the milk as soon as strained. If an apparatus for airing and cooling at the same time is not at hand, the milk should be aired first. This must be done in pure air; and it should then be cooled to 45 degrees, if the milk is for shipment, or to 60 degrees if for home use or delivery to a factory.

36. Never close a can containing warm milk that has not been aerated.

37. If cover is left off the can, a piece of cloth or mosquito-netting should be used to keep out insects.

38. If milk is stored, it should be held in tanks or fresh, cold water (removed daily), in a clean, dry, cold room. Unless it is desired to remove cream, it should be stirred with a tin-stirrer often enough to prevent forming a thick cream-layer.

39. Keep the night-milk under shelter, so rain cannot get into

the cans. In warm weather hold it in a tank of fresh, cold water.

40. Never mix fresh warm milk with that which has been cooled.

41. Do not allow milk to freeze.

42. Under no circumstances should anything be added to milk to prevent its souring. Cleanliness and cold are the only preservatives needed.

43. All milk should be in good condition when delivered. This may make it necessary to deliver twice a day during the hottest weather.

44. When cans are hauled far, they should be full and carried in a spring-wagon.

45. In hot weather, cover the cans, when moved in a wagon, with a clean, wet blanket or canvas.

The Utensils.

46. Milk-utensils for farm use should be made of metal and have all joints smoothly soldered. Never allow them to become rusty or rough inside.

47. Do not haul waste-products back to the farm in the same cans used for delivering milk. When this is unavoidable, insist that the skim-milk or whey-tank be kept clean.

48. Cans used for the return of skim-milk or whey should be emptied and cleansed as soon as they arrive at the farm.

49. Clean all dairy-utensils by first thoroughly rinsing them in warm weather; then clean inside and out with a brush and hot water in which a cleansing material is dissolved; then rinse; and lastly, sterilize with boiling-water or steam. Use pure water only.

50. After cleaning, keep utensils inverted in pure air, and sun, if possible, until wanted for use.

After discussion it was moved and seconded that the Report of the Milk Commission receive the support of the Society. The motion was carried.

Dr. J. H. McKee and Dr. Mary Buchanan exhibited a patient with amaurotic family idiocy.

THYMUS AND SUDDEN DEATH.—Dr. Eleanor C. Jones read the report of a Case of Thymus Enlargement in an Infant, in which Sudden Death Occurred. The child, which was three and one-half months old, died very suddenly after he had for a few hours been noticed to be restless and to be breathing somewhat rapidly. Other symptoms were absent. Post-mortem examination showed general enlargement of the lymph-nodes, the thymus and the spleen sharing in this enlargement. The measurements of the thymus were 7 cm. in length, 3½ cm. in width, and 2 cm. in thickness. The family history was tuberculous and alcoholic.

This child was one of six delicate children, four of whom had died in early infancy. His own condition had never been satisfactory, and he had shown signs of beginning rickets. Some days before his death, he had had three slight general convulsions. The case was considered to belong to the class described by Paltauf as "status lymphaticus," this being demonstrated by the coincident enlargement of the lymph-nodes and of the thymus and spleen. There was no evidence that the enlargement of the thymus had caused death by direct pressure upon the trachea. There was no history of dyspnea, or so-called "thymic asthma"; and the autopsy showed the trachea to be normal, in configuration. There had, however, evidently been considerable pressure upon the great vessels and upon the base of the heart, as the direct result of the hypertrophy of the thymus. The patient's sudden, quiet death was probably due to heart-paralysis; death usually occurs in this way in the "status lymphaticus."

Dr. John H. Jopson, in discussion, said that all agree that this case corresponds very closely with the classical description of the status lymphaticus with an associated enlarged thymus, to the enlargement of which death has, until within a few years, been attributed in these cases. The present theory as to the association of sudden death with enlarged thymus is a changed one, owing to the fact that in the status lymphaticus there is a very marked tendency to sudden death, not only spontaneously, but also from slight, usually non-lethal accidents. The majority of these cases of sudden death in which there has been associated general enlargement of the lymphatic glands have followed chloroform anesthesia. Other immediate causes of death in these cases are slight physical and mental shocks. The injection of a dose of antitoxin has even been sufficient to bring about sudden cardiac paralysis. The case reported corresponds in every detail with the description given in the most recent works upon this subject.

Dr. Griffith said that no one can know just how the cases of this sort that pass away during the night die, but that those whose death is observed usually die with the symptoms of laryngeal spasm. The fatal result in these cases is wrongly attributed to a spasm of the larynx; but the probable truth is that they are really instances of death due to syncope. A fatal issue in true spasm of the larynx is probably very uncommon.

Dr. Jones, in conclusion, said that she had nothing to add, except to ask Dr. Griffith for his opinion in regard to the pressure. She desired to know whether the death in these cases might be due to the direct irritation produced by the pressure of the enlarged gland upon the heart and the great vessels. This was Dr. Jones' first experience with such a case, and she had asked Dr. Griffith for this information because she knew that he had had a great deal of experience with them.

Dr. Griffith replied that the theory has often been advanced that death is due to pressure upon the large vessels or upon the nerves, but that there had not been found any proof of the correctness of this. Besides, many cases in which there is clearly no pressure exerted die with the same symptoms. The inference is, therefore, that pressure is not the cause of the sudden death. There is undoubtedly pressure exerted upon the trachea in some cases; but in these the symptoms come on gradually, and are clearly of a stenotic nature. Dr. Griffith accepted the view that these sudden deaths are due to a neurosis. This neurosis, as well as the anatomical changes in the lymphatic system generally accompanying it, are both the results of faulty metabolism. Children with this neurosis are liable to sudden death from unknown or slight immediate cause.

Dr. Jopson said that one theory as to the cause of the sudden death that had not been mentioned is that there may be an autointoxication due to increased activity on the part of the enlarged thymus.

Dr. Hamill said that unquestionably there are cases of enlargement of the thymus gland in which the enlargement is not a part of the status lymphaticus, or, if so, that it is the only manifestation of this condition. He had run across cases of sudden death in new-born infants, in which there was enlargement of the thymus without general enlargement of the lymphatics. Dr. Hamill had had the idea suggested by Dr. Jopson in mind when that gentleman spoke; and it had occurred to him also that some of these cases may be dependent not so much upon an intoxication resulting from deranged function of the thymus as upon some type of infection. In most infections of the new-born, there are marked respiratory disturbances, similar to those which occur in these cases. In certain instances, these respiratory manifestations are of short duration, occurring within a few hours of death. In this particular case there was some elevation of temperature; and it had occurred to Dr. Hamill that there might have been an infection, resulting in marked disturbance of the respiratory centers and in rapid death.

Dr. Miller said that a certain number of these cases are due to pressure. It is well known that there have been several instances in which the gland has been removed or partially removed from children with symptoms of asthma, and the operation has afforded complete relief. In these cases it would be interesting and valuable if there were some method of diagnosticating the enlarged gland. In a case exhibited before the American Pediatric Society in 1901, Dr. Jacoby said that when the child was turned over on its face the gland could be percussed; but that when it was lying on its back, this was often impossible. Whenever a child has repeated attacks of difficulty in breathing, enlarged thymus should be thought of; and this device, said Dr. Miller, should be borne in mind.

ENDOCARDITIS.—Owing to the absence of Dr. Henry D. Jump his paper on Endocarditis following Diphtheria was read by Dr. Gittings. An abstract follows: (See PEDIATRICS, August.)

It is not unusual for dilatation of the heart, with consequent insufficiency of the mitral valve and irregularity of the pulse, to complicate diphtheria. Less commonly, true endocarditis is seen. The first of such cases was reported by John Bridges in 1864. The most important work in this connection has been done in the diphtheria-wards of the South Branch of the Boston City Hospital. Hibbard analyzed 1,052 consecutive cases; and found a systolic murmur, an accentuated second sound, and increased heart-dulness in 85, or eight per cent. In 15 of these, the condition continued for from five to fifteen weeks. In the pathological report of the fatal cases from the same hospital, (220) by Councilman, Mallory and Pearce. Seven cases of endocarditis were noted. From one of these, the Klebs-Loeffler bacillus was isolated. Howard, of Johns Hopkins, and Wright, of Harvard, each also report one case in which this bacillus was found. The case reported by Dr. Jump was in a child that had had a mild attack of diphtheria. During convalescence, it showed the signs of acute endocarditis—rigor, fever, irregularity of the pulse, increased heart-dulness, and a mitral systolic murmur. These conditions were still present a year later. The mitral valve is the one usually affected; the aortic is more rarely involved.

EDITORIAL

ANOTHER LOST ILLUSION

From time immemorial it has been taught that cows' milk is acid, while breast milk is alkaline, and that in order to render cows' milk more like breast milk it is advisable to use lime water—giving it its proper alkalinity for the feeding of infants.

This belief has been rudely disturbed by the co-operation of physiological chemists and clinicians in a comparative study of breast milk and cows' milk and the effects of the addition of alkalies and other antacids to cow's milk by Drs. Charles G. Kerley, A. H. Gieschen and George T. Myers, at the New York Infant Asylum (*Medical Record,* Vol. 64, No. 6).

Utilizing modern chemical methods, particularly bearing in mind the work of the leaders in physical chemistry, Nernst and Ostwald, and being alive to the more recent discoveries and perplexities of chemical titration methods, these authors have shown that much of the common teachings concerning acidity and alkalinity of milk is erroneous and particularly misleading.

The observations are worthy of study by pediatrists. Their conclusions are as follows:

(1) Breast milk and cow's milk are both acid; (2) the litmus paper test for milk is unreliable because of the variation in the quality of litmus paper, and the litmus taking part in the reaction and not acting as an indicator; (3) the effect of adding lime water or bicarbonate of sodium to feedings is to retard or inhibit the formation of curds by rennet; (4) the teaching that lime water, bicarbonate of sodium, or carbonate of potassium should be added to fresh milk or feedings simply because they are antacids is erroneous; (5) the addition to milk or feedings of alkalies or salts that become alkaline in solution is an empirical method of aiding digestion by preventing the formation of dense curds that would slowly leave the stomach and be difficult of digestion in the intestine.

THE HOT-WATER BOTTLE AND THE NEWLY BORN

Even with the hot-water bottle it would seem that our blessings are not unmixed with perils. There is much of good and little of evil in its influence, yet Dr. Douglas A. Stewart (*Medical Record,* Aug. 8, 1903) calls attention to one danger that is well worth holding in memory.

He shows with sound physiological evidence that new-born babes may actually be killed by excess of heat from the use of too many or badly applied hot-water bottles.

The danger lies not so much in the fact of a burn to the skin, but to the general raising of the temperature of the infant beyond the point of safety. A particular danger to which he directs attention is due to the use of glass bottles placed about the neck. Here they are apt to impinge upon the carotid arteries, and thereby raise the temperature of the blood as it flows directly to the brain.

Foster, in his well-known work on physiology, says that "if the blood in the carotids be warmed above the normal, dyspnea is produced," and this local application of hot bottles, Dr. Stewart maintains, can bring about just this condition. "The regulative heat mechanism is unable to stand the strain," says Foster. Dr. Stewart quotes the following instance:

"A perfectly healthy new-born child was placed in his crib, a hot-water bag underneath him and a bottle filled with hot water each side of his neck. This was the nurse's precaution, as the room was not very warm. She knew how efficient an ice-bag was when applied to the vessels of the neck, and she supposed heat could be utilized in the same manner with good effect. At the end of about a half-hour, on uncovering the child, I was surprised to find it breathing in a most peculiar manner, similar to the Cheyne-Stokes' respiration. This soon ceased after picking up the infant, but, a few days later, I saw the same sort of dyspnea in an older child; only here it followed a long continued poulticing of the neck. The rectal temperature was 104.2° F. The poultices were discontinued, and all bad symptoms had disappeared at the time of my second visit, i.e., about two hours after the removal of the poultices."

One reason, he says, that such occurrences are not found frequently, is that the rubber hot-bag does not readily fit into the neck, but bottles will roll, and will stay snugly against the skin over the vessels of the neck. In his case, as the bottles formed an arch, their tops being in contact, any question of antero-posterior pressure may be dismissed. As to the temperature, he says that any degree or amount of contact heat sufficient to keep the temperature in the carotids at 110° F., or over, will certainly produce the disturbances described in about thirty minutes.

Surely this is a timely warning and one that should reflect great credit upon the careful clinical observations of Dr. Stewart.

ABSTRACTS

Cow's Milk Kumyss as a Nutrient in Disease.—Dr. E. F. Brush (*Therap. Gaz.*, 1903, p. 443) says about the year 1870 the first attempt was made to produce kumyss in the United States. A physician then residing on the east side in New York City ventured its production. He recommended it as a sure cure for consumption, but for some reason he did not persist for any length of time in its production. Since that time thousands of physicians , druggists, nurses, dairymen and others have been attempting to make kumyss in this country. Many formulæ have been published in the daily press, medical journals, cook books and dispensatories, but few have been able to make a satisfactory kumyss, and the reason is that it is far more difficult to produce alcoholic fermentation in cow's milk than in any of the other sugar-containing fluids. In the manufacture of fermented liquors a special knowledge of fermentation and temperature that influence this change is required. The brewmaster must be one with a large experience in the art of brewing, and he must have a special training, although under ordinary circumstances a malt solution will undergo the alcoholic fermentation spontaneously. Cow's milk does not lend itself to the processes of fermentation necessary in the preparation of kumyss as readily as does mare's milk; and, therefore, the production of kumyss among the people who keep horses and use their milk is simple and easy even when the people do not understand the principles of fermentation or brewing. As all the kumyss made on this continent is necessarily made from cow's milk it can be readily seen why the home-made product is so often a failure. To produce good kumyss from cow's milk one must have, like the champagne maker, cellars with various temperatures so as to favor fermentation at the different seasons, refrigerating-rooms to check fermentation when it is sufficiently advanced, and experts to watch the process and know when to hasten, delay or check it. Also there must be a dairy of perfectly healthy, clean animals, properly fed, whose milk is absolutely clean, and so handy to the laboratory as to be able to get the milk in time to commence the yeast fermentation before any of the other changes natural to milk have started. So it can be seen that it must be more difficult to produce a good kumyss than it is to make a good champagne. Who would think of giving a guest, or a sick person, home-made champagne? although this variety of a sparkling wine could not possibly be worse than much of the home-made kumyss that is in the market to-day. It requires from five to ten days to ferment cow's milk sufficiently to use it as kumyss, and when it is properly made it will keep in an ice-box, refrigerator, or any place where the temperature is below 40° F., for from ten days to three weeks. But the best made kumyss will spoil within twenty-four hours if kept in a temperature above 60° F., because as is well known, all varieties of food which spoil rapidly in a high temperature digest easily if the spoiling process has not started first. Any preservative added to a food protects it against the digestive process as well as against the spoiling. Kumyss properly made—that is, cow's milk with all the fermentative sugar changed into alcohol and carbonic acid—will not undergo the spoiling changes if kept at a sufficiently low temperature in less time than ten days or three weeks without preservative. Any preservative is fatal to the usefulness of kumyss.

Writing about kumyss in Ziemssen's Handbook, Dr. Stange says: "Kumyss claims a foremost place among those articles of food with which unfortunately physicians interest themselves less than they do with drugs." And I suppose the principal reason for this lack of interest, especially in this country, is owing to the amount of poor stuff called kumyss that is thrown on the market. Therapeutically kumyss is indicated in all diseases of the digestive organs, as catarrhs, acute and chronic diarrheas, and in many cases of dyspepsia. It is the most grateful and useful food in all the continued fevers, and in the convalescence from typhoid fever and pneumonia. Kumyss is truly invaluable in the treatment of consumption. It is especially useful in the beginning of phthisis. It cannot do much if the patient is already in a stage of diarrhea and colliquative sweats. If kumyss is taken steadily in other chronic lung diseases the nutrition is improved. Kumyss is very useful in anemia and chlorosis—in short, in all conditions of defective nutrition, as in protracted suppuration, prolonged lactation, in convalescence from fevers, in scurvy and its allied diseases, and as stated above, in diseases of the digestive organs. The properties of kumyss are briefly summed up as follows: The promotion of the formation of fat and promotion of sleep, the promotion of nutrition in general, and lowering of the temperature and the pulse.

Dr. Postnikoff, writing in 1873 in a Russian medical journal, said: "The action of kumyss on the organism can be characterized in three words: 'Nutrit, roborat, alterat.'" And he also said: "Kumyss exerts an alterative action on the vascular system, the pulse becoming fuller and more frequent."

For babies with summer complaint, or for badly nourished children, I quote the following clinical experience of two well known physicians: "The next best food for babies is kumyss. In a certain proportion of cases it even excels all other foods. I will give you an instance. A doctor came to me in regard to his own child. The baby was four months old, and was suffering from summer complaint. He had tried all kinds of foods—sterilized milk and other foods. The child had wasted to skin and bone, and he was afraid that it could not live more than a few days. I was about getting off to the country, and I told this doctor that I could not go to see his child, but that I would advice him to try kumyss. He did so and the child recovered. He told me that the child commenced to pick up at once."[1]

Kumyss is particularly useful in cases of alcoholism and delirium tremens. Professor W. Gill Wylie, of New York, in an article in the *International Journal of Surgery,* writes as follows: "I used this preparation with very marked success in a patient of mine who was recently taken sick with bronchitis, which developed into a pneumonia, and it became a very grave question whether he would live or die. He was a man sixty-five years of age, who had been a heavy drinker, and during his sickness his stomach refused food of every kind. I ordered six bottles of kumyss daily, which he took with excellent results, and I firmly believe that the man's life was saved in consequence.

"There is also another pathological condition in which I give kumyss with very decided advantage, and that is in patients who have delirium tremens. I am satisfied that delirium tremens is the result of exhaustion of the nervous system from lack of proper nutriment, and the best way to cure such patients, in my opinion, is to give them food that is at the same time nutritious and easily digested. I would give a patient with delirium tremens as much kumyss as he could take, and I have never yet known a patient who could take five or six bottles of kumyss a day that would not get well within a week."

Some of the most difficult cases of vomiting can be controlled better with kumyss than with any other food. The quantity of kumyss can never be prescribed exactly; one must always begin with small doses and gradually increase it in such a manner as not to excite repugnance. The amount for an adult is the largest quantity that may be taken without discomfort, two to six or eight bottles a day. The course of treatment is usually begun with two or three tumblerfuls a day, increased gradually to several bottles, and carried on about six to eight weeks; but it is more beneficial in chronic wasting diseases when prolonged, because of the comparatively little good done by kumyss in the first weeks.

Some patients, though not liking kumyss in the beginning, become quite fond of it in time. In the continued fevers the dose should be all that the patient requires, both for nourishment and to quench thirst. With infants the dose is correspondingly small, in some conditions beginning with teaspoonful doses.

Bow Legs and Knock-knee.—Daniel LaFerte, of Detroit, Mich., in *Am. Jour. Surg. and Gynec.*, April, 1903, says that while it is not possible to treat all cases alike, yet the methods followed in the two cases which he reports serve as a fair illustration of his methods in the management of such cases at the Children's Free Hospital, where there are constantly cases of that nature under treatment.

Case I. The first case, though it appears mild, is nevertheless one of true unilateral genu valgum. When a line was drawn from the head of the femur to the internal malleolus, that line passed to the outside of the center of the knee-joint. The anterior surface of the femur looked directly forward, the foot pointed forward instead of inward, and when the leg was fully extended the inner surface of the knee touched the well knee, but the malleoli

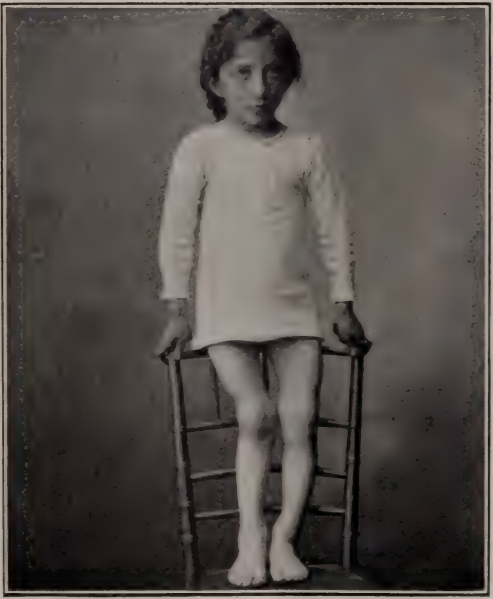


Fig. 1.—Jennie G., photograph, July,

of the tibiæ could not be made to come in contact. When the leg was fully flexed upon the thigh the genu valgum disappeared. Here, then, we had to deal with a condition consisting of elongation of the internal condyle of the femur, discussed at so much length by Poore, causing the deformity. That being the case, the wearing of braces would be of little use. In such a case it has been his experience that nothing short of an operation effects a cure. He has now and then succeeded in rectifying knock-knee with braces, but it has been in those cases where no elongation of the internal condyle of the femur existed. In the case under consideration he performed MacEwen's operation, which consists in sawing through the lower end of the femur a little above the epiphyseal line. This section is made with an Adams's saw, the periosteum having first been raised from the bone by means of a narrow periosteum-elevator. This method he regards as much safer than using force by applying an osteoclast. Osteoclasis in the neighborhood of so important a joint as the knee is dangerous. After the bone had been sawed, the limb was treated as an ordinary fracture; it was brought around into the straight position and a light plaster-of-paris bandage applied. This remained on

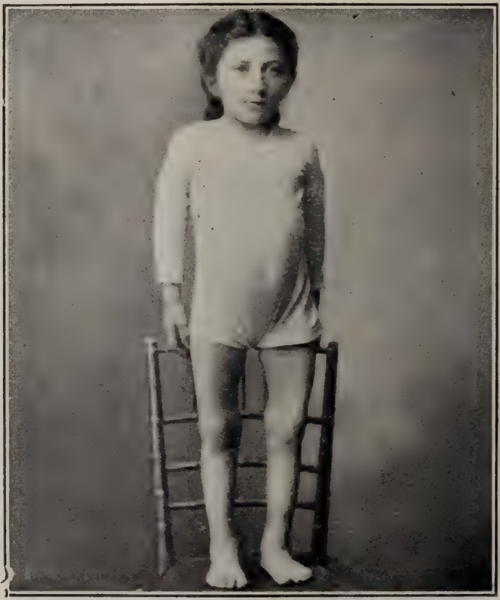


Fig. 2. Jennie G., photograph, January, 1903.

for four weeks, which is about the average time that the limb is kept bandaged. He lets his patients begin to walk if they will at the end of that time, but finds that most of them do not care to walk much until about the end of six weeks. The result in this case is shown in Fig. 2.

Case II. If the term "bow-legs" is to be applied only to cases in which the whole lower limb, from the great trochanter to the malleolus, presents a curve, then bow-legs in his experience (during his eighteen years' connection with the Children's Free Hospital) rarely exist. During all that time, with the many cases coming under his observation, he recalls only one case where it was necessary to cut both femurs as well as the bones of both legs in order to rectify the deformity. He has seen some cases where the femurs seemed slightly bent after the curve below the knee had been removed, but that curve was so slight as not to require interference. The pathological condition existing in the lower end of the femur, viz., elongation of the internal condyle, seldom exists on the opposite side in genu varum. The vast majority of the cases of bow-legs (which term may not be strictly correct) which he has been called upon to treat have been a bending of the tibia and fibula below the knee-joint, and the trouble could be traced to a present or pre-existing rachitic condition. In subjects up to about the third year it is possible to straighten those limbs by

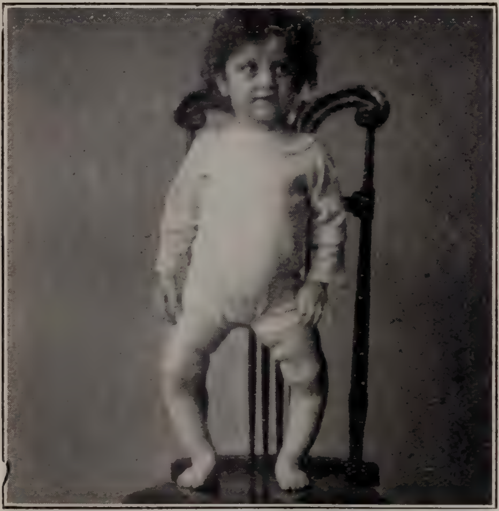


Fig. 3. Eva P., photograph, July, 1902.

means of braces worn for one or two years, provided there remains considerable softness in the bones. If the rickets have been cured spontaneously or otherwise, the bones become as hard as ivory and braces cannot overcome the curve, and nothing short of an operation will suffice. In the case represented in Fig. 3, the bones could be sprung back with the hand and braces could have remedied the difficulty, but the parents pleaded poverty and were unable to buy the necessary braces. The child was given chloroform, and with his hands he made a green-stick fracture of the bones in both legs, slightly correcting the deformity. Fig. 4 shows the results obtained.

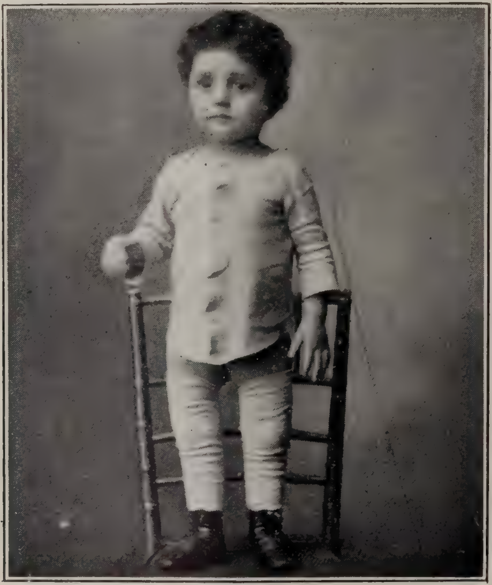


Fig. 4. Eva Pa., photograph six weeks after operation.

Antidiptherine in the Treatment of Diphtheria.—Those opposed to the serum treatment of diphtheria are not confined to this side of the water, though the American journals have persistently urged the poisonous character of diphtheria antitoxin. A recent onslaught is found in the *Journal de Médecine de Paris* of June 28, 1903, from the pen of Dr. Aramian. He claims to have had excellent results with the use of a local remedy, called "antidiptherine." The composition of this remedy is not given, but it is contained in a communication to the Academy of Medicine, and will shortly be published. The writer starts with the following rubric: "My opinion, as well as that of several of my colleagues, is that the bacillus of Loeffler is not found in the internal organs, nor in the blood." Acting on this premise it naturally follows that the bacillus should be attacked locally and not by the injection of a serum. The author does not get as far as the American "antis," and admits that the serum may render much service; but why use it if you have something better, especially as it is dangerous? Here is the crux of the whole argument. The claim is made that the serum is dangerous *per se*, that it is a poison, and if injected into the body cannot but cause harm. In support of this argument the writer has gathered together a number of cases in which the injection of the serum was followed by bad results, and three or four cases in which injection had been followed by immediate convulsions and death. This group is headed by the striking case of the son of Professor Langerhans. The writer has treated fifty-three cases with his new local remedy and has had only two deaths, which he attributes not to an extension of the local process, but to an involvement of the lung. These extended quotations from this paper have, of course, no practical value, but they show a faulty logic. He supports his use of a local remedy by arguing that the antitoxin is dangerous. This has not been proved. The cases that he cites in which death followed the injection of antitoxin can as well be explained by other causes—in fact, a hypodermic injection of water, the pulling of a tooth, or some other interference might have precipitated the untoward result. The evidence is so conclusively in favor of the value of antitoxin, particularly if used early, that one feels impatient with those who do not recognize its value.—*Medicine*, Aug., 1903.

Aneurism of the Arch of the Aorta in a Small Boy.—JORDAN (*Lancet*, February 21, 1903) records the case of a boy, aged six and a half years, who had been the subject of otitis media since boyhood, and who began to suffer with headache, vomiting and fever. These symptoms grew worse, swelling of the left knee set in, and at first increased, but afterwards completely disappeared. When apparently convalescent, he died suddenly. The post-mortem examination showed the brain and meninges to be normal; the tympanic cavities contained muco-purulent fluid. The pericardium was distended with blood which had come from the rupture of an aneurism of the ascending arch of the aorta on its anterior aspect. The aorta in the vicinity of the aneurism was perfectly normal, and the valves and cavities of the heart, as well as the heart muscles, were quite healthy. There were no vegetations or other signs of the action of micro-organisms. The lungs and air passages were normal. There was not the slightest evidence of this being of traumatic origin, and Dr. Andrews, the pathologist and curator of the museum of St. Bartholomew's Hospital, regards it as an acute infective aneurism, and suggests that in the absence of any other evidence as to its causation it may have originated as a localized septic aortitis, possibly due to a minute pyæmic embolus in one of the vasa vasorum. An embolus of this nature might occur in any small artery; in the present case it happened to occur in a very unusual situation, and apparently in this one situation only.

Congenital Absence of the Clavicles.—Two cases of congenital absence of the clavicles are reported by HARVEY M. SHERMAN (*American Medicine*). Case 1.—That of a boy of three with marked evidence of rachitis. On the left side there could be felt only a rudimentary clavicle and only the sternal half of the bone on the right. The radiagram failed to show either of these as visible bones. The function of the shoulder joint was practically perfect. It was possible without pain or discomfort to bring the shoulders forward and touch them together under the chin. Case 2.—A girl of seven with well marked rachitis. Examination failed to show even rudimentary clavicles. As in the previous case the shoulders can be made to touch each other under the chin without pain. There is no interference with the motion of the arms.

PEDIATRICS

Vol. XV. OCTOBER, 1903 No. 10

ORIGINAL ARTICLES

ON THE USE OF OPIUM IN THE CARDITIS OF CHILDREN[1]

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Following the late Dr. Octavius Sturgis in the use of the general term carditis, as expressing the frequently observed phenomenon of the implication in the inflammatory process of more than one, and it may be of all, the structures of the cardiac wall, I shall briefly sketch the irritative conditions which this term denotes, before referring to their treatment by opium.

Normal cardiac action, especially in the higher animals, being due to the harmonious co-operation of the hæmic, muscular and neural factors in such action, it follows that morbid action is a result of the disturbance of this harmony by agencies affecting one or all of these.

As the blood bathes all the structures of the heart, its invasion by disease-producing agencies naturally affects all the structures which are dependent upon it for their nutrition. Bacteriology has taught us that the blood, circulating in the chambers and in the vascular system of the heart, may carry such morbific agencies, and thus be the cause of those secondary effects which we find expressed in the inflammation of the various constituents of the organ.

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[1] Read at the Provincial Meeting of the Society for the Study of Diseases in Children, on June 20, 1903.

The aim of the physician should doubtless be to remove causes, and, having done so, to expect effects to disappear. But, great as have been the triumphs of therapeutic bacteriology in some spheres, patients still die from the effects even of toxic agents of the nature of which we know somewhat, and also from the effects of those of which we know little or nothing, except that certain effects produced by them prove fatal to patients. Were we, under these circumstances, to wait for the discovery of causes before endeavoring to cope with known effects, we should be acting neither rationally nor humanely. Effects as well as causes, however, point the way to rational treatment, for effects are themselves the secondary causes of still further disaster, and life is usually lost, not when the first outworks are stormed by an unknown or invisible enemy, but when rampart after rampart has been taken, and the central keep itself assailed by enemies who may easily be seen if looked for. Not, that is, by the first onslaught of a primary cause, but by the pernicious influence of effects which may be laid bare to the eye by macroscopic and microscopic examination.

These effects in carditis may be seen in all the structures of the heart, and consist in the main of all degrees of inflammation, recent and of longer standing, of the vessels, nerves, interstitial textures, muscle cells, and serous surfaces of the organ. Of these, the serous surfaces and interstitial textures seem to be those chiefly affected in the majority of cases, the nerves and muscle cells suffering, as a rule, from the inflammation of these, until all the cardiac textures may be involved in a general conflagration.

Indeed, just as the study of reflection in a raindrop may explain the glory of the rainbow, so inflamed blood vessels, such as may be found in the epicardium of a heart affected by pericarditis, may epitomize the processes taking place in the organ generally. Thus the thickened fibrous coat of the artery, the abundantly proliferating intima and the apparently increased muscular tissue of the vessel with degenerated nuclei, may be regarded as corresponding to the inflammatory, hypertrophic and degenerative processes which are observed to affect, in many cases, all the textures of the organ, from the endocardium to the inflamed, or it may be adherent, pericardium. To wait for the discovery of a rational means of coping with first causes would, under these circumstances, be irrational. As Dr. Cheadle has, with practical sagacity, remarked in one of his lectures, "while the grass grows, the steed may starve"—while the physician holds his hand waiting for scientific enlightenment, the patient may die, if we do not promptly grapple with death-dealing effects, or secondary causes—if we do not, that is, gain from signs and symptoms the cue to successful interference.

In the treatment of carditis, to the minds of most physicians of to-day, two main facts have become apparent: (1) The uselessness of adding fuel to the fire by irritation or counter-irritation; and (2) the desirability of allaying, by all means at our command, local and general irritation and unrest. In acting on such lines, the important rôle played by the central and peripheral nervous system scarcely requires to be emphasized. And yet the condition of the cardiac nervous system is rarely investigated by the pathologist. When one considers the rich endowment of the heart by nerves, and remembers the anatomical situation of the main streams of these in the intermuscular connective tissue—in those very parts, namely, in which we meet with the most marked evidences of inflammation—we cannot avoid the conclusion that agents which relieve irritative states of these governing channels of cardiac action are calculated to be most useful in dealing with such states.

In the preparations which I have placed on the table, the course and distribution of the cardiac nerves may be observed surrounded, if not actually affected, by actively proliferating connective tissue in the specimens prepared from fatal cases of carditis. The staining of the finer nerves in specimens taken from the dead body is not an easy matter. I have therefore placed among the pathological specimens a Golgi preparation which I made from the heart of a cat which was anæsthetized and drowned. I was, for a time, inclined to regard the rich innervation here shown with some scepticism, regarding it as possibly the chrome silver staining of elastic tissue, but, having stained the intermuscular bundles by Nissl's methylene-blue method, and traced the nerve to its origin under the epicardium, as is well shown in one of the specimens, I am confirmed in my opinion that the Golgi preparation shown, exhibits nervous structures. If this be granted, we can well conceive how important a part in causing cardiac unrest may be played by the intrinsic nervous system of the heart when stimulated by an interstitial myocarditis.

Indeed, the efficacy of those measures, found to be most beneficial in the treatment of carditis, seems to point the same lesson, as does the inutility of agents found of much use in cases of non-inflammatory cardiac failure. Thus, we now know that it is altogether questionable whether the salicylates are an antidote to the rheumatic poison, but we have no doubt that no other agent so rapidly relieves the pain associated with that process, and thus indirectly calms the patient as a whole, and, with his general relief, the irritability of his heart also. Locally applied ice, in those cases in which it can be borne, in the virtues of which Dr. W. B. Lees strongly believes, can also affect the heart only through the nervous system, whether such consequence be regarded as directly sedative to the nervous structures or astringent to the inflamed blood vessels. The relief of pain by the local abstraction of blood is likewise an oft-observed phenomenon, and, when relief is thus obtained by the application of a few leeches to the præcordia, it can only act by relieving the irritation of nervous structures, for the amount of blood withdrawn can have little effect on the general circulation. But, useful as leeching and the application of ice may prove in the case of adults and in some children, the emotional excitement induced by these measures, in many children, renders their employment undesirable. The opposite method of treatment, by muscular and neural stimulants, such as digitalis and strychnine, when uncombined with a preponderantly sedative agent, on the other hand, has been found to be of little use, and, in the opinion of competent observers, even harmful. "Digitalis," writes Sturges, "still, to quote my own opinion (though it is that of high authorities as well, notably of Dr. Stokes), is worse than useless in the acute cases we are now considering."[1] Rest of mind, so far as possible, or the avoidance and subjugation of emotional excitement in children, together with repose of body and the employment of calmative agencies, general and local, is the treatment of carditis which the facts of experience have borne in upon the minds of physicians as most rational and most beneficial.

Among such calmative agencies, there is none more powerful than opium, where there is no idiosyncratic intolerance of the drug, and, when it is used with due care in children, in view of their special susceptibility to its action. There is reason to believe, indeed, that the fear of this special susceptibility has interfered with a sufficiently bold exhibition of it to attain the full benefit capable of accruing from its guarded but adequate use. The younger the patient, naturally the greater is the care necessary in its use, but even young children, when excited locally and generally by an actively irritative process, can tolerate larger doses than in normal circumstances. Indeed, the physiological consequences of inflammatory reaction resemble, in a measure, the phenomena caused by agents known to be antagonistic to the action of opium. The quick pulse, the dilated pupil, the suffused skin, the uneasy sleep, or even wakefulness and delirium, of the carditic child, may be likened to the poisonous effects of the belladonna group of agencies. It is under these circumstances that the use of opium finds its most beneficial application. This fact is of course well known, and has been mentioned by many writers, but rarely with the emphasis it deserves. Cheadle, however, relates a case in point: [2] "A boy of twelve, in the children's ward, with mitral disease, adherent pericardium, and resultant engorgement of both lungs, had frequent pulse and palpitation, with harassing incessant cough, which became so much aggravated on lying down, that he could not sleep. He began to lose ground rapidly, chiefly from want of rest. He was then given ten drops of nepenthe every four hours. Rapid improvement followed. The cough gradually ceased, the pulse rate fell from 120 to 90, good sleep was obtained, and appetite returned. It is worthy of note how the opium, in this case, acted as a tonic; instead of impairing appetite, it increased it by giving ease and sleep. This patient went out convalescent, to return in a few months in almost exactly the same condition—sleepless from incessant cough, due to congestion of the bases of the lungs. The same treatment proved efficacious a second time, and he went out convalescent." Dr. Cheadle expresses a preference for the use of opium by the mouth rather than hypodermically, regarding the latter method, from its rapidity of action, as not free from danger. As I shall presently relate, however, small doses of morphine, given hypodermically, may be well borne even by a young subject, provided the physiological antagonistic conditions be well marked. Gibson also speaks with approval of the hypodermic use of morphine, but his remarks are general, and appear to apply rather to the adult than the child. Ashby[4] relates that, in heart disease in children, "Small doses of opium are usually required, and are of the greatest use in relieving pain and quieting the heart's action. Half to two grs. of Dover's powder may be given at night, and repeated once or twice in twenty-four hours, according to circumstances." Barie[5] extols the value of hypodermic injections of morphine in pericarditis associated with pain, but prefers not to use it when there is evidence of myocardial weakness. On the general use of this ancient remedy in carditis and pericarditis no more need, however, be said. It is to encourage a more general and bolder use of it in the carditis of children that I have brought this matter before the Society.

With this view, I shall relate the following case, although it had a fatal issue after protracted illness, because it illustrates the tolerance of even a child for considerable doses of morphine when the physiological phenomena of general and local excitement are well marked, because also the general comfort of the patient was notably increased by such dosage, and, finally, because the postmortem examination of the body revealed the anatomical conditions which underlay the phenomena manifested.

Louisa V., æt. 5 years and 7 months, was admitted under my care at the Children's Hospital, Paddington Green, on February 18, 1903. She was stated to have been ill for two weeks, and complained of pain in the epigastrium and præcordia. She was also stated to have been very feverish, and had pains in the elbows and knees. Her appetite, however, was good, and the bowels regular, the urine was free from albumin, and there was no swelling of the feet, or other sign of anasarca. She was apparently a highly neurotic, peevish, and restless child, apart from her illness. No history of previous illness could be obtained, except that she had had measles. She was one of five children, the other four of whom were stated to be healthy. No history of rheumatism could be elicited, but the child's maternal grandmother was alleged to have a "bad heart." The tenement occupied by the family was near the canal, and the house was said to be damp.

The patient after admission maintained the orthopnœic position, and had manifest difficulty in breathing. The area of cardiac dulness was increased, measuring 4 in. transversely from the right edge of the sternum to beyond the apex beat in the fifth left intercostal space, and 2½ in. vertically from the lower edge of the second left rib cartilage to the fifth intercostal space. There was visible pulsation all over the præcordia and the epigastrium. There was a loud systolic bruit at the apex completely obscuring the first sound of the heart, conducted outwards to the left, and audible in the back. There was likewise a diastolic bruit at the apex. There was a bruit during systole in the aortic area, and both second sounds were without bruit. In the tricuspid area bruits systolic and diastolic in time were audible, and there was marked reflux into the internal jugular veins. The area of cardiac dulness did not vary in size, and it was assumed, therefore, that there was no pericardial effusion, nor was there any pericardial friction. The pulse rate varied from 108 to 120, and its volume was good. The lungs anteriorly were free from evidence of engorgement, although entry of air was not forcible. Both lung bases posteriorly had a flat percussion note with crepitation and defective respiration. The respiratory rate was high, varying from 58 to 72. The temperature was 99.2°. It would be tedious to relate at length the daily changes in the condition of the patient; I shall therefore only indicate salient features in its progress, and reserve for fuller treatment the period during which the patient was more particularly under the influence of morphia, as that is the proper burden of our present theme. The range of temperature throughout the case while under observation, varied from a little above normal (99° to 100° F.) to about a degree below normal (96.8° to 97.8° F.). The pulse rate was highest during the first month after admission, ranging from 130 to 150, after which it fell to an average 120 for the morning, sometimes slightly more, sometimes less, and was slightly higher, as a rule, in the evening than in the morning. The rate of respiration was likewise, as a rule, higher in the evening than in the morning, and reached its highest general range about a fortnight after admission (7th

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[1] "Heart Inflammation in Children," p. 75.

[2] "Lectures on the Practice of Medicine," London, 1900, p. 34.

[3] "Diseases of the Heart and Aorta," p. 278.

[4] "Diseases of Children." 4th Ed. p. 416.

[5] "Traité Pratique du Mal de Cœur," Paris, 1900, p. 213.

March, 1903), and continued high (52, 60, 64, 68, 72) until the end of March. Small doses of opium were first added to the medication on the 4th March, namely, 2 minims of tincture of opium every six hours. This had no appreciable effect. An additional minim per dose was added on 16th March with as little result. Four minims of nepenthe were given every four hours after the 30th of March, apparently with somewhat more benefit, the pulse rate and respiration becoming quieter, and the child more comfortable. On the 5th of April the dose of nepenthe was raised to 6 minims with apparent benefit. This was, however, but a timid feeling of one's way as regards the effect of opium, and was merely an adjunct to other attempted means of relief. Leeches were from time to time applied over the liver, a procedure which the child keenly resented, and ultimately cried bitterly if that animal was mentioned in conversation within her hearing. Ice was applied to the præcordia as much against her will as the leeches were to her right hypochondrium. Both procedures added much to her excitement and unrest, and had to be abandoned. The patient was evidently becoming progressively worse. She slept little, constantly cried out as if in pain, and continuously taxed the efforts of the nurses who assiduously attended her day and night. The legs and a portion of the trunk and the face became œdematous, the liver enlarged and pulsated, the bases of the lungs became more engorged, and the cardiac area was increased, but without evidence of fluid. That is, without notable variations in the level of the upper left percussion dulness. The legs were satisfactorily drained by Southey's tubes, and the general anasarca of trunk and face greatly diminished.

On the 9th of April, finding the chief deteriorating factors were the continuous restlessness and sleeplessness of the patient, and the progressive dilatation of the heart, I prescribed hypodermic injections of 1-200 of a gr. of digitalin, 1-100 of a gr. of strychnine, and 1-16 of a gr. of morphine, to be given with careful observation as to general effects, every four hours. During the first twenty-four hours four doses were given, amounting altogether to one-fourth of a grain of morphine. The hypodermic injections were accurately measured, and freshly prepared by the dispenser to the Hospital. The morning pulse rate on the 9th of April was 132, the evening, 164. The respiratory rate in the morning was 62, in the evening, 68. The temperature in the morning was 97°, and in the evening, 98.2°. Next day (10th) the precise dosage of morphine is not noted in the chart, but it was prescribed to be used as conditions necessitated. She is stated on the 12th to have had a quiet night. The pulse rate was noted as 124, and the respiration rate as 24. The pupils were beginning to react to opium. During the next twenty-four hours, however, the child must have become more restless, for the hypodermic injection of morphine had to be administered every four hours, amounting in all to about one-half a grain in twenty-four hours. On the 13th, the patient had in all one-eighth of a grain, and slept only three hours during the night, but slept well after daybreak. The respiratory rate is noted as 32, and the pulse as 112. On the 17th, although the patient had each day (with the exception of the 16th, when she had 1-16 of a grain), had one-eighth of a grain of morphine hypodermically, the pupils are recorded as "not contracted." The general condition of the patient continued one of comparative comfort until the 25th of April, although her local signs showed little amelioration. One of my colleagues, in passing through the ward, remarked to the house physician, "That child looks better." On the 52th, however, an increase of morphine to one-fifth of a grain in twenty-four hours was necessitated, and next day the child needed one-fourth of a grain, and the same amount for two days afterwards. On the 28th, the record is that the child had had a fair night, having slept from four to five hours in snatches; and the pupils are stated to have been "rather smaller." The pulse rate was 138 to 144, and the respiratory rate 32 to 36, while the temperature was 97.6° to 98.2°. There was œdema of the left lung apex anteriorly, but not much congestion of the bases; the liver edge was half an inch below the umbilicus, the pulse was regular and of good volume, and the jugular distension was less marked. As the patient had been sick three times on the 28th, the strychnine and digitalin were omitted. For the next three days only 1-16 of a grain of morphine were given, the digitalin and strychnine being resumed on the 30th as the cardiac failure was greater. The patient died at 4:15 a. m. on the 1st of May. For careful notes of the case I am indebted to Dr. Carey, recently House Physician to the Children's Hospital, Paddington Green. On post-mortem examination the pericardium was found to be adherent to the costal pleura from the fourth to the sixth ribs on the left, and to both the lungs. The parietal and visceral layers of the pericardium were universally adherent, obliterating the sac. The heart likewise adhered to the diaphragm. The transverse diameter of the heart was much increased, and the surface veins of the organ engorged. The total weight of the heart, including contained blood and attached vessels, was 13 oz. All the cavities of the heart contained blood clot. All the valves were normal except the mitral on its auricular surface, where there was a fringe of granulations. The auriculo-ventricular orifices admitted two fingers. The right auricle was dilated. The right ventricle was not dilated, and, in fact, appeared to be rather smaller than usual. The left auricle was not markedly dilated. The left ventricle was both dilated and hypertrophied. There was atheroma at the orifices of the coronary arteries, but the arteries themselves were healthy. Both lungs were congested, chiefly at the bases. There were no infarcts, and no evidence of tuberculosis here or elsewhere. The capsules of the kidneys stripped easily, the surface veins were engorged, and the cortex was somewhat increased in depth; and although the urinary output was small and difficult to collect during life, the urine was only rarely found to contain a little albumin from circulatory stasis. On microscopic examination, the pericardium was thickened and of organized structure, vessels in it were found affected by endo-arteritis and peri-arteritis, with changes in the muscle nuclei. Nerve trunks were seen involved in the pericardial inflammation. The interstitial texture of the myocardium was thickened and increased in quantity, and the nuclei were increased in number from proliferation, but there was no evidence of excessive connective tissue proliferation of recent date. The muscle fibres had in places well marked transverse striæ, but this was not well marked in the majority of the fibres.

There are many questions raised by the consideration of this subject, which the scope of this paper and the limits of time preclude my discussing, such as the comparatively recent or more chronic nature of the inflammatory process necessary to bring about a symphysis of the pericardium such as this case revealed, the cause of death in the heart disease of children whose muscular fibre is well preserved—a point to which Struges draws special attention,[1] and the influence in preserving or prolonging life of various therapeutic measures. Although, with Dr. Lees, we may have "given up the idea of curing pericarditis,"[2] we may nevertheless agree with Dr. Sturges, who writes rather pessimistically of the therapeutics of carditis in children, when he remarks, "The easing of pain by local appliances, the procuring of sleep therewith, the timely withdrawal of blood to relieve venous congestion and cardiac dyspnœa,—all these measures are truly life-saving; but the course of inflammation is little if at all affected by such means."[3] I have already indicated my belief that the mechanism by which some of these measures tend to save life is by their action on the cardiac nervous system, that they are avowedly directed against effects, not a primary cause, and that, although they may not directly affect the course of an inflammation—a point which can scarcely, in my opinion, be regarded as proved—they may nevertheless maintain life until the conflagration has burned itself out, or the protective processes of the body eliminated the intruding cause of the disease. Among such measures in combating the effects of carditis, I feel disposed to give a prominent place to opium, and it is with a view to emphasizing the capacity of children for tolerating considerable doses of the drug under suitable circumstances, that I have ventured to draw the attention of the Society afresh to its employment in the carditis of young subjects.

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[1] Op cit. pp. 25-27. [2] Lancet, July 22, 1893. [3] Op. cit., p. 74.

INFANTILE COLIC.[1]

By Alexander McAllister, M.D., of Camden, N.J.

Many little things are in reality the great things of life. The observation is that of a philosopher, simply borrowed for the occasion. The statement has a threefold application to infantile colic. It applies to the infant itself, especially in its earliest life; to the mother, particularly if she be young and inexperienced, and to the family physician. By the law of continuity it applies as well to the infant's father, but this observation of the philosopher we will not stop to borrow.

It need not be remarked that colic is one of the first thorns in the infant's pathway, and of frequent occurrence, especially in infants deprived of breast milk; that colic is merely a symptom, and that its presence and prevalence are only exceptionally indicative of disease. Disease is rather a result of an attack of colic upon the comforts of the infant and the household in general. Colic is a discordant note in the tenor of the young life, an indication of the presence of a disturbing factor by no means always arising from improper food or faulty digestion.

It is not the present purpose to write exhaustively, but simply to call attention to a few pertinent points in the causation, diagnosis and treatment of infantile colic.

The most commonplace and trivial circumstances in the life of the mother may excite an attack of colic in the tender nurseling. An irregularity in her diet, her physical activity or her mental equilibrium may be the sole and unexpected exciting cause of an attack or repeated attacks of colic. Thus a toothsome condiment sparingly indulged, moderate exercise and a mild burst of passion in the mother may yield the same disturbance in the physical atmosphere of the infant.

On the other hand lack of cleanliness in the nursing bottle or nipple, too rapid feeding, too frequent or too long deferred feeding in the artificially fed may be enumerated as common causes of attacks of colic. On this score alone the hose and nipple equipment of nursing bottles can not be too strongly condemned. The long tube and small nipple present a number of nursery conveniences which should never offset their one great disadvantage. With the greatest possible care they cannot be kept sufficiently clean and hygienic. On the other hand, they are always of too great immediate service for the infant's best welfare. The writer recommends only the bottle nipple. Nature has wisely designed that even the tenderest infant shall pay the price of labor for its sustenance. This it is always compelled to do when drawing milk from the mother's breast. At birth its cheek muscles are already well developed for this sole purpose. In the normal amount of labor expended to secure the breast milk the salivary glands are vigorously stimulated and the milk reaches the stomach well mixed with saliva.

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[1] Read before the New Jersey State Medical Society, June 24, 1903.

These ideal conditions are seldom duplicated in artificially fed infants. Rubber nipples are more easily plied than fleshly nipples. They are of necessity patulous and yield milk rapidly and with comparatively little labor on the part of the infant. After several nursings rubber becomes soft and admits of a veritable stream without much effort. For these reasons infants prefer rubber nipples, and it is a stubborn fact that when they have had a rubber nipple for a short time they will not again return to breast nursing.

This subject is treated so fully in order to emphasize the importance of proper care in the selection, use and rejection of nipples. Probably half the nipples in the shops should never be used, or be used only a few days. The best should not be used more than ten days or two weeks. It is the writer's uniform practice to restrict the use of any nipple to two weeks, and to order the employment of two nipples that one may lie in an alkaline cleansing wash while the other is doing service.

As a rule an attendant should always hold the bottle while the infant is taking nourishment. Only in this way can the evils of too rapid feeding be avoided.

Mothers frequently charge their infants with excessive greed and rightfully attribute to this attacks of colic. In many such instances the fault is not in the infant, but in the nipple. What is interpreted as greed is simply effort to avoid choking. The volume of milk passing through the nipple necessitates rapid swallowing and what seems to be voracity, is in reality distress.

The diagnosis of colic is not always correctly made without a careful physical examination. Mothers may judge wrongly. The cry which the mother quickly accepts as an infallible sign of colic is only an expression of distress, which may or may not be due to pain, especially in older infants.

Pain in the very young may result from soreness incidental to birth, griping accompanying the earliest movements of the bowels, urinary retention caused by phimosis, renal colic and kindred incidents in the establishment of normal functions. In older infants earache, teething, soreness in the abdominal muscles, tender joints due to rickets and other painful maladies must be considered in the diagnosis of colic.

The signs of colic are well known, but require for their recognition more or less physical examination. These signs are hardness of the abdomen, palpation of coils of intestines, tendency of the infant to draw up the legs and the expulsion of flatus, accompanied by vigorous crying. Cessation of crying after the passage of flatus is, of course, always a sign of the proper diagnosis.

Errors in diagnosis not infrequently lead to misapprehension and early weaning, with disastrous results. The infant has discomfort, which is at once attributed to colic. The usual household remedies bring no relief. Hunger supervenes upon copious draughts of hot water and crying continues. At this junction charges are made against the breast milk. The infant is offered a nursing bottle and its entire future at once assumes a different character. In this disastrous transaction the family physician, willingly or unwillingly, is not infrequently a party.

In the treatment of infantile colic too careful circumspection in the use of drugs cannot be practiced. The prompt relief which narcotics afford has power to hypnotize the dearest guardian and entail serious results upon a helpless life. A drop of paregoric is but the forerunner of ten drops, or of that still more charming dose, a drop of laudanum, and, this point reached, the seeds of a drug habit, or later in life an alcohol habit are already securely planted. The fact that the family physician ordered an opiate on a certain occasion is too frequently taken by parents as authority to use opiates on every occasion. The tendency to use the soothing syrups of the shops needs no encouragement. All these and kindred facts merit due consideration in the treatment of colic.

Many cases can be promptly relieved by a little manipulation of the infant, with or without gentle massage of the abdomen. This method of treatment would be too trivial for recognition in this connection were we not considering little things of life. On the other hand it may be observed that the family physician may not infrequently render the highest service by instructing the mother or nurse how to jump an infant, abdomen down in order to secure relief from colic. Many cases of so-called colic are simply flatulency or, in nursery parlance, "wind on the stomach." In all such cases manipulation is the only legitimate treatment.

Next to the foregoing the remedy of greatest value in the treatment of infantile colic is warmth. This may be applied to the abdomen dry or moist, or employed internally in the form of sips of hot water, or of hot enemas. Friction with warm oil along the line of the colon is of special value because combining warmth with manipulation.

The most unique means for applying warmth in the treatment of infantile colic is a small hot water bag. The writer has found these bags generally serviceable and never fails to order one when such treatment is required. They may be utilized in very young infants with entire satisfaction. Infants will fall into quiet sleep with a bag resting upon the abdomen. The treatment cannot harm, no matter how frequently or persistently employed. On the other hand, such treatment is decidedly beneficial also in improving digestion and nutrition.

In spite of every effort to the contrary some cases, especially in older infants, require medication with carminatives. In such the standard teas frequently prove too weak. Resort must be had to more concentrated remedies.

The formula of paregoric with opium excluded makes a remedy of considerable value. The dose is easily regulated, beginning with a few drops, to the requirements of the case.

Rotch recommends that carminatives be administered with alkalies between feedings to counteract the high degree of acidity of the stomach always present, especially in bottle-fed infants. The following is one of his favorite prescriptions:

℞ Sodii bicarp ....40 grs.
Spirits Ammon. Arom................40 m.

Glycerini ....30 m.
Aqua Menth. pip. q. s. ad............ 2 oz.

Sig.—One teaspoonful between feedings.

When acidity is not an element requiring special treatment lac asafetida is frequently of value.

In concluding it may be remarked that the use of narcotics in the treatment of infantile colic is only exceptionally justifiable.

CONSTIPATION IN INFANTS AND YOUNG CHILDREN[1]

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Preliminary Considerations.—In treating of the digestive derangements of infants and young children, it seems reasonable to assume that, presupposing a healthy child, the organs of digestion and elimination are as nearly perfect as may be, regarded as means to an end, his age largely precluding the chronic morbid processes met with in later life. At intervals, variations in his environment, avoidable and otherwise, act prejudicially upon the normal processes of his digestive economy—processes the more easily affected, in that their general stability is not yet sufficient to accommodate itself readily to such variations; and there results, amongst other signs of reaction, defective elimination of waste products, which so far may be regarded as a purely local matter. If, however, the local effect becomes long continued, there are added, in many cases, general and far-reaching symptoms, which may be traced partly to an unstable equilibrium of the nervous system, and partly to excessive reaction to morbid stimuli, which in later life are more easily tolerated. Whilst it is probable that the presence of undigested food in the intestine may, in certain cases, set up, in a reflex manner, a reaction out of proportion to the cause, it is perhaps more likely that toxic products are absorbed from the putrefactive material in the intestinal canal, and the result intensified by defective elimination of poisonous products derived from the general metabolism, which in the child is peculiarly active. At the same time, faulty digestion produces a diminution of food substances, and general malnutrition follows, in which the entire organism shares. The original digestive defect may be transitory, but with constipation a series of inhibitions and perversions of the mechanical, glandular and nervous activities is set up, which tends to perpetuate itself and gives rise to a train of symptoms, removable by effective treatment directed to the bowels; and for this reason the subject of constipation merits close attention.

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[1] *Edinburgh Medical Journal.*

Briefly stated, the natural stimuli to intestinal peristalsis are those acting mechanically, such as the distension produced by gases, or a sufficient amount of solid residue, and the pressure exerted by the diaphragm and abdominal parietes; and those which produce their effect by chemical stimulation of the nerve-endings, such as the various gases and chemical substances found in the fæces, the products of digestion and bacterial activity. Normally, the rectum is empty, until the contents of the sigmoid flexure are forced into it by a peristaltic wave, started either by voluntary muscular effort, as in straining, or by the above causes acting singly or in combination; the presence of fæces in the rectum then excites reflex contraction of its walls, by which the contents are expelled.

The stimulus to peristaltic action originating in Auerbach's plexus, and regulated by the cord and sympathetic, probably passes chiefly along the nerves, and not along the muscular fibers; upon this view, the nervous system of the intestines, and particularly of the colon, plays a prominent part in the production of constipation; and in this connection the possible toxic effects upon the nerve-endings, of the products of decomposition, in inhibiting their action both upon the muscle fibers and upon the glands, is to be noted.

Constipation arises from two chief causes—diminution of the expulsive power of the intestine, and increased resistance. Diminution of the expulsive power may arise from some nervous defect, either central or peripheral, by which the reflex activity concerned in producing peristalsis is diminished or abolished, or by the occurrence of dilatation of the colon, which, to a greater or lesser extent, is present in cases of habitual constipation. These two factors are probably concerned in the production of "atony" of the gut, whilst it is possible that in those cases in which defective action of the bowel seems to be hereditary, diminished reflex excitability plays a large part, as also in cases in which constipation is determined by deficiency in bulk of the intestinal contents, The presence of lime salts in the fæcal material is said to affect unstriped muscle, and tends to interfere with the due performance of peristaltic action, whilst the anemia which generally accompanies constipation produces a general loss of tone, in which it is reasonable to suppose this muscle shares. Increased resistance may arise from abnormal dryness or hardness of the residue in the colon, or from gross obstruction from the presence of stricture, bands, tumors, and so forth. Excessive dryness and hardness may result from a deficient amount of fluid drunk, from defective glandular activity, or may follow prolonged stay in the large bowel, and consequent excessive absorption of moisture and diminution in bulk; whilst imperfect digestion, by producing an abnormal consistence and composition of the fæces, contributes to a similar result.

When, from any of these causes, a tendency towards undue delay in the colon has arisen, it is probable that mechanical and chemical irritation induce a catarrhal state of the mucosa, which to some extent destroys the nicely balanced absorptive processes, and toxic products, the result of bacterial activity, are admitted to the circulation; these, by first acting in an inhibitory manner upon the terminations of the nerves, accentuate the peristaltic defect, and increasing absorption produces widespread results, among which may be included the nervous phenomena met with in some cases. However this may be, apart from local effects of unduly prolonged presence of fæcal material in the colon, symptoms occasionally arise in children which may be regarded, with considerable show of reason, as due to the action of a toxine upon the cerebral centers, and, in so far as such symptoms disappear with free evacuation of the bowel, seem to be due to absorption from the intestinal canal. It must not be inferred that defective action of the colon is solely responsible for symptoms arising in connection with constipation; derangement of the chemical processes of digestion in the small intestine may, and probably does, play a part, as may be seen from the frequency with which undigested material is found in the evacuations.

In infants, at least, it is highly probable that, in a majority of cases, constipation is chiefly dependent upon defect in the food, by which embarrassment of the digestive economy is produced, and imperfectly elaborated residue is left to be dealt with by the colon; in addition to this, there must of course be taken into account the general depressing effect of unhealthy surroundings. In older children additional factors must be considered, which may be summarized under habit and hereditary disposition.

Assuming, therefore, the important part played by diet in the production of constipation in infants, it becomes necessary briefly to survey the characters of the staple food of infancy, namely, milk, both human and otherwise.

The percentage composition of the milk of a healthy woman is generally stated to be:

Fat	4.13
Lactose	7.00
Albuminoids	2.00
Salts	0.20
Water	86.67
	100.00

The reaction is always alkaline, and its taste sweetish; it is bluish white in color, and thin and watery in consistence. The specific gravity is 1031. It has, therefore, all the elements necessary for growth and maintenance of the bodily heat, proportioned to meet the requirements of the infant.

The above table must, however, be regarded as an average composition only; the albuminoids, fats and salts are normally liable to variation through very considerable limits, depending upon the personal peculiarity as well as upon the diet of the lactating woman, whilst departures from health are seriously prejudicial both to the quantity and quality of the breast milk. The least variable factor in its composition is the sugar, or heat-forming element. From this analysis the most striking features appear to be the relatively high percentage of fat and sugar, and the relatively low percentage of albuminoids. Though percentage composition must be regarded as of the utmost importance, as representing the standard by which artificial foods must be measured, if they are to be of the maximum value when substituted for human milk, certain other properties must not be lost sight of which render human milk the food most suited to the digestive system of the infant. Amongst the most important of these are the characters of the curd formed, the absence of bacteria and their products, and the relative proportions in which the casein and lact-albumin coexist. The curd formed from human milk is light and flocculent, which, in addition to being of a kind easily accessible to the action of the digestive juices, may depend upon other and less understood differences, the importance of which it is difficult to overestimate, having regard to the readiness with which digestive disturbance is set up in infants. The importance of a sterile milk is obvious, whilst the relative proportion of the coagulable and non-coagulable albuminoids, casein and lact-albumin, is probably a powerful factor in the digestive and nutritive value of the fluid. In human milk the non-coagulable constituent is said to exceed the coagulable by twice the amount of the latter, a point having obvious bearings upon the ease of gastric and intestinal digestion.

The average percentage composition of sound dairy milk may be regarded as:

Fat	3.98
Lactose	4.30
Albuminoids	3.42
Salts	0.70
Water	87.60
	100.00

Its reaction, alkaline immediately it is drawn, rapidly becomes feebly acid, the specific gravity 1029; bacteria are always present.

Considering percentage composition alone, there are obvious differences between cow's and human milk, which may be roundly summarized by saying that cow's milk contains the same amount of fat, two-thirds the amount of lactose, and nearly twice as much proteid, as human milk. Of these the fat and lactose are practically identical with that found in human milk, but profound character of the curd formed by the action of rennet, which in cow's milk forms a thick, solid and tough mass, five times greater, weight for weight, than that of human milk, and tending to contraction and increasing toughness.

It seems clear from this, that whilst the percentage composition may be made to approximate very closely to human milk by suitable dilution and addition of fat and lactose, a marked difference must always remain in the character and behavior of the proteid constituent when subjected to the action of the gastric juice, which, though apparently easily dealt with in many cases by infants, may in some cases be a source of digestive trouble.

Assuming that the milk of each type of animal is peculiarly suited to the needs of the young of the same species, it follows that milks are not altogether interchangeable; and the reason of this would appear to be partly in the percentage composition and partly in certain properties peculiar to each, which may perhaps be termed physiological, an indication of which may be found in the behavior of the constituents when subjected to the action of the digestive juices. What these differences precisely are is not sufficiently known, but Dr. Chapin has pointed out that the character of the curd produced by the action of rennet (which differs from that produced by mere acidulation), seems to be correlated with the peculiar type of digestive organs found in the individual species from which the milk is taken. In animals whose digestion is mainly gastric, as in the goat and cow, the curd formed is solid; in the mare and ass, whose digestion is chiefly intestinal, gelatinous curd is produced, which offers little difficulty in passing from the stomach to the intestine; whilst in the human being, in whom digestion is more gastric than that of the horse or ass, but not so great as in the cow or goat, the curd is flocculent, and stands in a position midway between the other two. Whatever may be the precise value of this observation, it certainly points to fundamental differences between various milks, which mere percentage composition is insufficient to explain, and gives a hint that when the human infant is fed upon a milk of one of the lower animals, there will frequently arise difficulties which, however they may be due to contamination and the like, are also conduced to by radical peculiarities which artificial standardization will not wholly remove.

It is also worthy of note that boiling—and similarly Pasteurization, though to a less extent—in some way renders digestion of milk more difficult and children so fed exhibit a lowered vitality and a greater tendency to intestinal derangement; some children, indeed, are totally unable to digest boiled milk. Furthermore, the addition of cream to diluted cow's milk, in order to make up the requisite percentage of fat, is not quite the same thing as drawing the milk direct from the maternal breast, owing to the differences in the character of the emulsion in the two cases. In this connection Starr gives it as the result of his experience, that carefully standardized laboratory milk is an unsatisfactory method of artificial feeding; infants exclusively so fed exhibiting in a majority of cases signs of malnutrition and intestinal disorder, and in some instances infantile scurvy. The reason of this result, so entirely different from what accurate percentage composition would lead us to expect, is to be sought for, according to the same author, in some change in the proteids produced by the destruction of the natural emulsion in passing the milk through a separator; domestic modification of the milk, being free from these objections, he regards as a far more satisfactory method.

Etiology.—The etiology of constipation may be considered under three headings: (1) in the suckled infant; (2) in hand-fed infants; (3) in older children.

In sucklings, simple constipation is due to some defect in the mother's milk, arising from faulty diet or a departure from health. Unhygienic surroundings, constipation, mental anxiety or worry, the occurrence of menstruation or pregnancy, or the presence of some debilitating disease, may produce changes in the milk, which react upon the infant; similarly, want of sufficient nourishing food, or, on the other hand, a too liberal diet—in a word, some faulty habit of life affects the general health of the mother, and produces a change in the quality or quantity of her milk, which has its result in enfeebled nutrition and defective digestion on the part of the infant.

As has been already indicated, human milk is liable to variations, which may be considerable, apart from definite disease; and where a requisite amount of fat is not present, or an excess of proteid occurs, results in the infant may be expected somewhat analogous to those produced by similar defects in the food of the hand-fed child.

On the other hand, the possibility of an hereditary predisposition in the child, or an enfeebled digestion, whether congenital or arising from any cause, may render an otherwise healthy mother's milk beyond the power of the infant to deal with; at the same time it is necessary to examine very closely into the physical condition of the mother and surroundings of the child before pronouncing "weak digestion" to be the cause, lest by undue weaning and artificial feeding the child be rendered liable to greater evils; for, whatever precaution be taken in the selection or preparation of a "humanized milk," such a food can at best only be a comparatively human milk, and by no means always an efficient substitute, even with the most exact percentage composition. Again, overfeeding, i.e., too frequent feeding, leading to digestive derangement and excessive bulkiness of the residue, is a frequent cause of constipation in sucklings.

It occasionally happens that a history of biscuits, or other starchy foods, in addition to the breast milk, is elicited from the mother, who has been impressed with the idea that her milk is insufficient in quality or quantity; here, of course, the additional factor must be considered.

When constipation is said to have existed from birth, the possible presence of some local condition, such as fissure, which by the pain it occasions is a cause of constipation, congenital malformation, or grave disease within the abdominal cavity, must be borne in mind.

In hand-fed children, constipation is a much more frequent source of trouble, and often difficult of treatment, arising as it does in many cases from causes beyond the reach of the natural remedy. The condition is generally ascribed to deficiency of fat, or indigestibility of the proteid constituent of cow's milk. Overfeeding is a common cause, and perhaps most frequently occurs in the case of infants whose digestive powers are in the first instance hardly equal to the kind of food they receive, and in whom the cry due to colic is mistaken for that of hunger. Some infants are wholly unable to digest cow's milk unless partially peptonized. An attempt to fix a regulation type of artificial milk preparation cannot be entirely successful, for something depends upon individual peculiarity, and that which one has thriven upon may be altogether unsuited to another. Again, the residue in the colon may be insufficient in volume, or too unstimulating, or excessive drying may have taken place from absorption. Unhealthy surroundings, by lowering the general bodily tone, tend to produce those digestive troubles which lead to defective action of the bowels.

When starchy food has been given too early, the symptoms are initially due to imperfect digestion. It has been shown that a pancreatic juice, having an appreciable action upon starch, is not secreted until the third month, and it is highly probable that the power of complete digestion of starch is not possible in many infants until much later.

Among other causes of constipation are rickets, general depression from any cause, want of fresh air, anemia, acute diarrhea, and the habitual use of enemata; whilst, occasionally, remedies injudiciously given for colic may be the cause.

In older children, similar general considerations are applicable as in the case of hand-fed infants—defective diet, overfeeding, and unhealthy surroundings; but here the special influence of habit and of sufficient exercise must be borne in mind. Sedentary habit, involving want of a due supply of fresh air, and accompanied probably by overheating, is easily followed by general want of tone, in which the intestinal muscular and nervous systems share. The influence exerted by irregular habits of going to stool is to be explained by the production of toleration and blunting of reflex excitability in the colon; the ease with which this may be induced may be reasonably inferred from the large amount of control exercised by the will over defecation. In this connection careful inquiry is particularly necessary, and a history of regular habits should be accepted with caution, especially in older children. Parents and nurses frequently infer regularity of action of the bowels from daily visits to the closet, when nothing is really known of the frequency or effectiveness of the movements; to be effective, the action must not only be regular, but sufficient in amount as well. The history may also be misleading from another reason, that looseness of the bowels may co-exist with constipation.

Want of a sufficient quantity of fluid drunk may be the cause, or any condition involving excessive loss of water, as profuse sweating or vomiting; insufficiently stimulating food, anemia, debility from any cause, abuse of stimulating purgatives or of enemata, may be added, together with the graver conditions beyond the scope of this paper. Among the latter may be mentioned the presence of abdominal growths, intestinal stricture or malformation, intussusception, peritonitis, hernia, diabetes, congenital dilatation of the colon, and meningitis. With regard to the last, meningitis, especially the tuberculous variety, may exhibit few symptoms pointing to cerebral disease; and where constipation is the prominent symptom, is liable to be overlooked, as in a case seen by the writer, where the minor symptoms of cerebral disease, though present, had been entirely lost sight of, the bowel condition at first being marked enough to obscure the true nature of the case.

Constipation is often associated with the presence of threadworms, very possibly in the relation of cause and effect, for a catarrhal state of the intestine, with excess of mucus, appears to offer conditions favorable to the development of the parasite.

Symptoms—In Infants.—The commonest symptom is that the child "does not get on"; wasting is not necessarily very marked, but, as a rule, there are present anemia and flabbiness of the muscles. There is frequently slight cough, the child is irritable and peevish, and frequently urticaria is seen. The tongue is moist and clean, or may show slight furring. The bowels may act once only in two or three days, or there may be daily movements. The motions are, as a rule, dry and pale, coated with mucus, and are passed with flatus and straining; occasionally they are loose, and contain hard lumps, consisting for the most part of undigested curd. Sleep is disturbed, and there is generally more or less abdominal pain due to colic.

In more severe and prolonged cases, wasting is marked, and fretfulness and irritability excessive, the result of colic, and also, in many cases, of hunger, from want of digestion and absorption of a requisite amount of food material. There is often slight pyrexia, and depression of the fontanelle is the rule. The abdomen may be distended from flatus, but is sometimes slightly retracted. Vomiting is frequent, and may be severe, occurring after all attempts to take food. Thrush is occasionally seen. Nervous symptoms may be prominent, restlessness at night, with twitching of the face and extremities. Fretfulness and irritability are almost always associated with dyspepsia, flatulence and constipation. In these cases, parents and nurses often speak of the occurrence of "inward convulsions"; this expression refers to a series of minor nervous phenomena, of which the most prominent are slight blueness and twitching of the lips, transient squint and turning upwards of the eyes, with slight carpo-pedal contractions. General convulsions, sometimes preceded by the above symptoms, may occur. The motions are similar to those already mentioned, but mucus may be excessive, and streaks of blood may be present;

straining leads occasionally to prolapse or hernia; piles are said to result at times. When constipation alternates with loose motions containing undigested material, the condition is occasionally spoken of as "consumptive bowels."

In older children, many cases of constipation exist with little impairment of the general health, and few symptoms beyond occasional feelings of discomfort, irregular appetite, and sallowness or muddiness of the complexion. In other cases there are wasting, abdominal pain after food, with nausea or vomiting, which may be frequent. The appetite is bad, the breath offensive, and the tongue more or less furred, especially posteriorly. Flatulence is complained of, and palpitation may be a prominent symptom. Sometimes the pulse is weak, slow, or irregular. Obstinate cases are, as a rule, accompanied by some degree of anemia. The abdomen is often prominent and distended with flatus, especially, as pointed out by Dr. Cheadle, at the level of the transverse colon; fecal masses may be felt, but this does not appear to be common, and fecal impaction is rare. Occasionally, as in a case under the writer's care, local flatulent distension may give rise to phantom tumors of an exceedingly deceptive kind. The stools are generally hard and dry, and are pale in color; sometimes looseness of the bowels is a prominent feature, and may alternate with constipation. Thread-worms may be present. Frequently there is slight pyrexia. "Bilious attacks" are complained of in some cases—acute dyspepsia, accompanied by headache, fever, anorexia, and vomiting, with furred tongue, sallowness of the skin and, occasionally, slight tinting of the conjunctiva. Generally, obstinate cases of this kind are marked by some form of mental disturbance, which shows itself by giddiness, faintness, general languor, or mental dulness; headache is common, and may closely simulate migraine. Nocturnal restlessness, with dreaming or talking in the sleep, is common, and should always suggest constipation, and an inquiry into the state of the bowels.

In certain children, particularly those of a neurotic stock or disposition, cerebral symptoms are the prominent feature. The nervous disturbance shows itself at night under the aspects of somnambulism and so-called night-terrors. In the latter, the child, goes to bed in the ordinary way, but, after an hour or two, wakes, or appears to wake, screaming and gesticulating; he does not at once recognize his friends, and is evidently in a state of extreme terror; after a time he is pacified, and falls asleep again. Such attacks, "screaming fits" they are often called by the parents, may be frequently repeated, rendering the child the subject of vague fears, especially on going to bed, and raising in his friends visions of grave cerebral disease. Similar symptoms are at times found in conjunction with the presence of adenoids, but by no means exclusively so, the writer having met with many in which examination of the naso-pharynx revealed a perfectly healthy cavity, and treatment directed to the bowels entirely relieved the symptoms. These attacks are probably of the same nature as nightmare in adults, the violence of the symptoms doubtless being dependent upon the ease with which abnormal stimuli provoke, in the undeveloped nervous system of the child, signs of apparently general cerebral disturbance. In this class of cases headache and vertigo may be severe, or there may be marked gastric symptoms with nausea and vomiting, whilst some are the subjects of habit spasm.

Among the graver results arising from habitual constipation in children must be mentioned dilatation of the colon, which, as in two cases under the care of Dr. Cheadle, and referred to by him in his lectures, may be remarkable. In one, constipation had lasted, with intervals of treatment, from three months old until three years. In the second, in which there had been obstinate constipation for nine months in a boy of five and a half years, dilatation of the colon was extreme, displacing the heart and compressing the bases of the lungs. There was great distension of the abdomen, with vomiting, dyspepsia and cyanosis; the heart's action was profoundly embarrassed; the case bearing a strong resemblance to those in which dilatation appears to be of congenital origin. Under suitable purgative treatment recovery took place.

Dr. Cheadle, similarly, describes cases of obstinate constipation in which severe vomiting, headache and marasmus have closely simulated organic cerebral disease, but in which the disappearance of the symptoms, under purgation, showed their origin to be intestinal.

The writer has met with many cases in which permanent relief of enuresis has followed upon the free exhibition of salines; and he is convinced that, in the simpler ailments of children, effective treatment of this eliminative function is frequently necessary, despite assurances of "regular" habits.

Treatment may be considered under three headings: (1) The suckled infant; (2) the hand-fed infant, and (3) older children.

In suckled infants, the causation lying, in simple cases, in some defect in the composition of the mother's or nurse's milk, treatment resolves itself into attention to the general health of the mother or wet nurse. A quiet, regular life should be insisted upon, with sufficient rest at night, and, if need be, during the day also, with an absence of mental worry and anxiety. The diet should be plain but nourishing and varied, and taken at regular hours; stimulants should be indulged in sparingly, and milk, either plain or diluted with one of the various aerated waters, taken in prearranged quantity. Simple ailments, such as constipation, slight anemia and the like, should receive appropriate treatment. Due allowance must also be made for exercise and fresh air. The infant should be fed regularly during the day, should sleep at night in a separate cot, and should not be fed between the hours of 11 p. m. and 5 a. m. in order to ensure a sufficient amount of uninterrupted sleep for the mother. The practice of putting the child to the breast every time it cries is to be strongly discouraged; it has been shown that the composition of the milk varies considerably from time to time, and particularly if drawn at irregular intervals; and an even composition is best ensured by regularity in feeding; moreover, fretfulness is so often due to defective digestion, that to put more milk into an already over-worked stomach has obvious disadvantages, and only makes matters worse. It need hardly be said that the commonly expressed wish of parents to wean, or give, in addition to breast milk, some kind of artificial food, because irritability and peevishness and apparently constant cry for more shows their milk to be "insufficient in quantity or quality," should receive very careful attention before it is acceded to, for such symptoms are as often the result of injudicious feeding as defect in the food supply. Sufficient fresh air must, of course, be allowed, and the child's extremities properly clothed.

Generally, attention to these details is sufficient; but if medicinal treatment is necessary as well, fluid magnesia, a few grains of carbonate of magnesia, manna, or an occasional dose of castor-oil, may be given. A small suppository or glycerine, or the domestic remedy of a small cone of soap, inserted into the rectum, is useful and efficacious.

The best test of progress is increase in weight, which should be at the rate of about two-thirds of an ounce per day up to five months old, and about one-third per day after that age is reached.

The indications for premature weaning are the occurrence of acute disease, or the presence of phthisis, abscess of the breast, menstruation or pregnancy in the mother, or symptoms of rickets in the child.

The treatment of artificially-fed infants is by no means so simple, and often extremely tedious; medicine alone is powerless to produce a permanent result, and may be distinctly harmful. The best effects are obtained by combining careful attention to feeding with the simplest and least stimulating drugs.

Food.—The common cause of constipation being excess of proteid and deficiency of fat, these defects must be met by suitable dilution and addition of cream. The degree of dilution necessary must depend upon the capacity of the child to digest the curd, as judged by the appearance of the motions, the presence of curd being an indication that too much casein is present in the food, remembering, however, the inability of some children to digest cow's milk at all. A glance at the previous tables will show that a fairly approximate percentage of casein will be formed by diluting cow's milk with an equal amount of water or other diluent; but at the same time the sugar and fat are unduly diminished. If, however, to four ounces of such a mixture, a tablespoonful of cream and a teaspoonful of lactose be added, a percentage composition closely approximating to human milk is formed. Such a mixture will probably require constant variation for particular cases; suitable proportions must be judged of by the progress of the child. With regard to the choice of a milk, it may be mentioned that that from a herd is of more reliable composition than that from a single animal, and less likely to vary from temporary or other causes.

It is better, perhaps, that all milk should be boiled, unless in those cases, occasionally seen, where boiled milk appears impossible of digestion. With regard to diluents, the action is purely mechanical, and various mixtures may be tried: plain water, barley or rice water, or a thin gruel made by boiling a tablespoonful of barley, wheat, or rice flour in a pint of water for fifteen minutes, and dextrinizing with one of the diastatic ferments. If lime water is used, a quantity not less than one-third of the milk must be added, but it is better avoided owing to its constipating tendency.

As to the amount to be given at a time, it is wise to trust the natural appetite of the infant, provided food is given at regular intervals, and vomiting is absent. Where this symptom is marked, small quantities given frequently may be retained, or condensed milk or one of the so-called humanized milks, may be tried. Sometimes stopping milk altogether for twenty-four or forty-eight hours, and substituting whey broth, meat juice, albumin water, or a thin dextrinized gruel, is necessary. Frequently, partial or complete peptonization suffices. The former is a very useful measure, for slight peptonization, whilst in some way changing the character of the casein, does not convert it completely into peptone, as is shown by the coagulation into fine particles which takes place on boiling, and so leaves room for the natural exercise of the digestive functions. A teaspoonful of fine oatmeal, made into a paste and stirred into the morning milk, is sometimes useful, or maltine may be added to two or three feeds during the day. If an alkali be necessary, sodium bicarbonate is less constipating than lime water, and if there is any doubt as to the perfect freshness of the milk, is useful to neutralize acid fermentation, as also if there is any sourness of the stools. A teaspoonful of Mellin's food added to the bottle of diluted milk is occasionally of service, by tending to relaxation of the bowels; and as in this preparation all starch is converted into dextrin and maltose, the objections applying to the addition of starch are overcome.

In older children the diet must be arranged to suit each individual case. Tea and coffee are best avoided, and milk or cocoa, either from the nibs or as generally sold, substituted for them.

Food should be light, plainly cooked, and taken at regular intervals; as to whether anything should be allowed between meals, must be settled by a consideration of the circumstances of the case. The writer is of opinion that stereotyped rules are of little use; and, within reasonable limits, a child should be allowed to satisfy his hunger both in this respect and in the amount of each meal; post-mortem observations on the capacity of the stomach are a guide within very wide limits only. Marmalade, jams, golden syrup, or treacle are all useful and possess some laxative effect. Stewed fruit is a valuable addition to the diet, and its effect is greatly enhanced if a few senna leaves are stewed along with it, and subsequently removed. Any kind of ripe, sound fruit may be allowed. Porridge and farinaceous food generally may be taken, but not, in simple cases, to the exclusion of a due proportion of meat and vegetables. Drink should be plain filtered water.

In obstinate cases the diet should be modified in the direction of a reduction of those articles which tend to leave a bulky residue, and it is well to reduce the amount taken at a time; in a word, the digestive functions should be taxed as little as may be until a more healthy tone has been set up. Pastry, sweets and salt meats are to be avoided.

Plenty of fresh air and exercise in the open are important factors; the exercise should be such as to call into play all the muscles and not one group only, an end not accomplished by a set walk.

Massage.—Combined with other treatment, this is a very valuable measure; to be effective, it must be carefully and systematically carried out, and persisted in; mere spasmodic efforts are useless. It is best applied night and morning, and is performed by kneading and circular movements, beginning in the right iliac fossa, and passing along the line of the colon to the corresponding position on the left side. At first it should be light and for a minute or two only, gradually being made deeper and longer continued. The hand and fingers may be lubricated with olive oil, but mere skin friction is insufficient, and rough or coarse manipulation harmful. The object is to stimulate the gut to action, by massage applied to it through the abdominal parietes. In older children massage may be applied for a proportionately longer time. It is of use in simple cases of habitual constipation only, and is contra-indicated where pain is produced, or where the symptoms are dependent upon grave abdominal disease.

Drugs.—For permanent good to be effected, treatment must be continued, and in obstinate cases prolonged. Little beyond temporary improvement is effected by the intermittent use of active and irritant purgatives, which, if long continued, may become ineffective in moderate doses, and ultimately set up a habit difficult of removal.

In simple cases, in infants, a teaspoonful of manna dissolved in hot water, or a few grains of phosphate of soda, either of which may be added to the milk, is often sufficient. Fluid magnesia, or a half to one grain of sulphur, rubbed up with milk, may be given. As an occasional purge, rhubarb and soda or castor-oil are perhaps the best, but are unsuited for habitual use owing to the constipating after-effect. Where constipation is obstinate, and the motions passed are white and hard, tincture of podophyllin is useful. In such cases it is well to begin with calomel, followed by a few grains of magnesium sulphate.

Enemata, or soap or glycerine suppositories, are useful measures, when moderate doses of medicine by the mouth have produced no effect, or it is necessary to get the bowels quickly open, but should not be long continued, owing to the tendency to catarrh and dilatation of the rectum which they produce. Eustace Smith recommends infusion of senna one-third, and inf. gentian co. two-thirds, of which a teaspoonful may be given for a dose, and to which may be added nux vomica or belladonna if necessary.

When colic and flatulence are present, the same writer recommends an infusion made by adding two teaspoonfuls of crushed caraway seeds to a pint of water, and boiling to one-half the quantity, of which a teaspoonful may be added to the milk. In all cases, alkalies and carminatives are of peculiar use in the treatment of the intestinal diseases of children. When pain, on or before defecation, is present, a careful examination of the anus and rectum should be made for some local condition, especially fissure, which may be easily overlooked even when multiple, and may be a source of obstinate constipation, which medicines alone are powerless to do more than temporarily modify. Euonymin, syrup of senna, or cascara are sometimes useful, but in the writer's experience unreliable in action.

In the treatment of these cases the object to be aimed at is to get the bowels freely open first, then to keep them open for a time by the use of medicines as little stimulating as possible, for which the simple salines in small and regulated doses are best, whilst the diet is modified, until, with the cessation of medicinal treatment, regularity of action continues. The intermittent use of irritant purgatives is both useless and harmful. It is well to remember that calomel and senna are themselves a cause of green stools. In all cases the extremities should be warmly clothed, and a regular habit encouraged in children from the earliest age.

In older children, similarly, regular habits of going to stool should be encouraged, and a fixed time for this duty insisted upon—after breakfast is probably the best. The presence of food in the stomach, after fasting through the night, appears to set up peristalsis in the lower part of the alimentary canal. It is worth while also to see that the position of the child when at stool is the natural one, that the hips are well flexed, and that he is not placed at a disadvantage at the outset by sitting on a seat altogether too high for him. The importance of position in this respect is very considerable.

Diet should be regulated, and the teeth receive attention. Any of the drugs already mentioned may be given in suitable doses, or aloes, aloin, sulphur lozenges, or one of the aperient confections. Where the taste is objected to, one of the various sugar or chocolate-coated preparations may be used. Various fruit tablets for this purpose have been devised, of which the two following are highly spoken of: Dates, raisins (the stones having been removed), and figs, of each four ounces; senna in powder, two ounces; the fruits to be finely chopped, mixed, and the senna added. The whole is then made into a paste with sherry, rolled into a mass of the thickness of half an inch, and cut into half-inch squares. One or two may be taken at night. Another is: Tamarind pulp, 36 grains; senna in powder, four grains, mixed, flavored with aniseed and lemon, and acidulated with tartaric acid. One may be taken every morning, or more often if need be, by a child of three years of age.

As already mentioned, enemata are of service if fecal masses have collected in the rectum, and may be either of soap and water, oil, or glycerine; but their use must not be persisted in, owing to the catarrh and dilatation set up by them, if continued too long.

For occasional use, in such simple cases, any of the above may be tried, and may be varied by one of the purgative waters; but for chronic or severe cases, especially if accompanied by cerebral or marked gastric disturbance, by far the best, in the writer's opinion, are the salines, magnesium and sodium sulphates, given in combination at regular intervals. If necessary, tincture of nux vomica, of of belladonna, may be added. A mixture, containing five to fifteen or twenty grains of each, or more if need be, may be given after meals with excellent results. To be of service, it is necessary that the amount of the salts given should be increased until effective, then continued for a sufficient time, and gradually withdrawn. Useful effervescing tabloids, containing fifteen grains each of magnesium and sodium sulphates, in which the taste is effectually covered, are made by Burroughs & Wellcome. In these more severe cases, again, for permanent good to result, treatment must be continuous and prolonged, and the temporary improvement which follows the copious action of the bowels must not be allowed to put an end to the treatment.

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CONTRIBUTION TO THE THERAPY OF ENURESIS *

By John Zahorsky, M.D., of St. Louis, Mo.

Enuresis is considered a very simple disorder, and it is true that in the vast majority of cases spontaneous cure is to be expected; but the practitioner will have all kinds of humiliating experiences in the management of these patients. What is a common experience under the ordinary text-book treatment?

The child improves temporarily, again relapses, the dose is increased, and again it loses its effect. After a few weeks the parents grow discouraged and send for another physician.

In another case little or no effect is produced by the ordinary remedies. In the third case atropine poisoning becomes manifest; the parents, frightened, refuse to continue the use of the remedy.

In a small series of cases the treatment is effectual, but the larger number are not cured, even when the atropine is continued for months. After a few years, fortunately, most cases recover; exceptionally the weakness persists to manhood.

The pathological physiology of functional incontinence of urine or enuresis is still somewhat obscure. In individual cases it is often difficult to determine what part of the urinary apparatus is at fault. And even to-day there is quite a controversy on the exact pathology of the disorder in general. Henoch (1881) admitted that we know very little concerning nocturnal enuresis, and is in doubt whether it is a diseased condition or the result of habit. He believes that the immediate cause is either atony of the sphincter vesicæ, or a spasm of the detrusor urinæ. The former is associated with diurnal incontinence also. In most cases he assumes a hyperesthesia of the neck of the bladder. Still, he admits that psychical impressions have a marked influence in the cure of the disease.

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*Read by title before the Missouri State Medical Association. By courtesy of *Interstate Medical Journal.*

This seems about the general opinion to-day, since most textbooks lay stress on the irritable mucous membrane, spasm of the bladder and peripheral irritation.

The treatment has in the main been entirely empirical, as based on the foregoing. Consequently, an enormous number of therapeutic agents have been more or less successfully employed.

It is my intention in this paper to review briefly the therapeutics of the past and give a treatment which has been fairly successful in my hands.

In the first place I will entirely ignore treatment made to restore local abnormalities, and also tonic treatment to increase the general nutrition. These measures are, of course, always indicated when local or general signs of disease are present. Then, too, I take for granted that indigestion and urinary hyperacidity have been corrected by appropriate dietary directions.

The older writers (West, Dewees, Eberle) recommended limitation of floods, preventing the child from lying on his back, tonics, cold sponging of the back and limbs, and in severe cases the tincture of cantharides was administered. This drug is not now used to any extent, but the other measures are recognized of great service.

It is curious how the older writers depended on this drug, the actual action of which depends on the irritating qualities of the urine which it induces. While great stress was laid on the elimination of the irritating qualities of uric acid from the urine, the administration of cantharides was conceded to be very effective. The drug stood in the same relation to the therapeutics of enuresis as belladonna stands to-day.

Some contradictory phases of the therapy appear.

Thus Charles Bell early in the nineteenth century made the statement that lying on the back predisposed to involuntary micturition, and various devices were employed to keep the child from assuming the dorsal recumbent position. Now, this procedure is disregarded. Yet a recent writer (Hovenden, *British Medical Journal,* March 22, 1902) again urges that the patient should be kept from lying on the back.

The various remedies used in the past may be classified as follows:

1. Measures to inhibit the contractions of the bladder.
2. Remedies to lessen the irritability of the neck of the bladder.
3. Remedies to diminish the acidity of the urine.
4. Means to lessen the quantity of the urine.
5. Measures to increase the tonicity of the neck of the bladder and the nervous system.

Bretonneau, according to Trousseau, made use of belladonna in the cure of enuresis, but the latter author first popularized it. Even to-day it is the most useful drug employed. Its effect is to inhibit the contractile power of the bladder, although it is said also to diminish the irritability of the bladder. The mode of administration varies, but it is recognized that large doses are necessary. While these large doses are effective, the cure is not permanent. Relapses are the rule. Holt recommends that the drug should be given for many months, but it is difficult to persuade parents to give it for many months when they can see no special benefit after a few weeks.

It is probable that rhus aromatic and rhus glabra also have some effect in diminishing the irritability and contractility of the bladder. Hyoscyamus acts similarly, but less powerfully.

Remedies to inhibit the irritability of the neck of the bladder are numerous. Martin (*L. Union Medicale,* 1892) advocated the use of antipyrene. It has become a favorite remedy. Others have found the hypnotics beneficial—e. g., chloral, sulphonal, etc. Opium and its alkaloids have been used for this purpose.

The administration of alkalies and their citrates and acetates to diminish the acidity of the urine is a common practice. They also act as diuretics, and in this way diminish the quantity of urine at night.

Means to lesson the quantity of urine has not received sufficient attention. The older writers particularly urged that the ingestion of fluids be diminished, but Holt warns that this means renders the urine more concentrated and, therefore, more irritating. We know of no drug which inhibits the secretory power of the kidney, although both ergot and belladonna have been used for this purpose. The former drug certainly diminishes the flow in diabetes insipidis, and its therapeutic value in enuresis may depend on this action. Rhus aromatic and rhus glabra probably also diminish the secretion.

I have found that the secretion at night may be somewhat lessened by stimulating the kidneys in day time; and I often prescribe some diuretic during the morning and noon time, followed by belladonna or other drug at night.

Measures to increase the tonicity of the neck of the bladder are commonly employed. Ergot and strychnine are the usual remedies for this purpose, although they must at the same time augment the contractility of the bladder.

Local measures are the passage of a sound, which probably causes a swelling of the mucous membrane; application of electricity; and the injection of some irritant in the prostatic urethra.

Herbsmann gave us a very effective means, namely, the massage of the neck of the bladder through the rectum. Caillag had good results with this procedure, but I have found that it is rather a difficult treatment to introduce into a family. The child does not take kindly to it, and the parents object.

Discussion of the means to tone up the nervous system brings out the fact that there has always been a tendency to regard enuresis an affection which depends on an abnormality of the central nervous system. Inasmuch as the sphincter vesicæ and the levator ani are under the control of the will, a strengthening of the cerebral inhibitory function is really the most effective treatment. Budge and Masso have shown that a contraction of the detrusor urinæ can be evoked by stimulation of the crura cerebri, medulla or anterior columns. Even the earlier writers bring this out, and there can be no doubt that mental stimulation by shaming or chastising the patient often results in cure. Probably it is true, as Holt urges ,that rewards are really more effective, and certainly they are to be recommended rather than the whip.

The stimulation to the nervous system is illustrated by a variety of treatments. Even Dewees (1835) used a blister to the sacrum with benefit.

The influence of cerebral function was clinically confirmed by Harkin (*Provincial Medical Journal,* 1887), who believed that a congestion of the medulla was the origin of the trouble. He blistered the nape of the neck with the liniment of cantharides and obtained the most remarkable results. It has often been pointed out that a change of residence, surroundings, companions, or occupation results in a speedy cure.

The lessened inhibition of the cerebrum is also shown by the symptom of Freud (*British Medical Journal,* p. 93, December 9, 1893; *Neurol Centralbl.,* December 21, 1893) to which little attention has been given and which I have corroborated in a few cases. This symptom is a hypertonic condition of the crural adductors.

"To elicit the symptoms the child is seated with its legs on a table, its feet are then grasped and an endeavor is made to separate them as wide as possible in a longitudinal direction. In a typical case the adductor spasm at first is considerable, but soon yields; on releasing the feet the legs spring back into contact." Spasticity also is found in the quadruceps extensor on attempting to flex the knee. The resistance here is very pronounced at first, but quickly subsides. If flexion be thus repeated, only slight extensor tension is observed. This symptom is rare in normal children. He suggests that excessive spinal innervation of the detrusor and of the crural muscles may be a factor in the combination of symptoms. This probably again depends on insufficient cerebral inhibition as in spastic paraplegia.

Among recent writers, Thiemich has very forcibly emphasized the cerebral origin of enuresis (*Berl. klin. Woch.,* 5 August, 1901). He argues that we cannot regard enuresis as a weakness of the cut-off muscle. He tries to prove that enuresis is only a symptom of a general nervous disorder; in other words, he regards it as a manifestation of hysteria. The proof he gives is that there is usually a neuropathic ancestry; that other hysterical symptoms are common; that epidemics occur in asylums and hospitals; that isolation of patient usually cures; that electricity cures no matter where applied; that the hypodermatic injection of strychnine has a curative effect, but the same result may be induced by a hypodermatic injection of salt solution; that the operation for adenoids, which often cures, acts by suggestion; and unsuccessful therapeutic attempts make the chances of future cure less. He finds the surest cure is the isolation of the patient.

The treatment advocated by Pendergast (*N. Y. Med. Jour.,* July 11, 1896) acts as a stimulant to the nervous system, and may be said to be a very powerful remedy for any hysterical tendencies.

The method employed in a boys' orphan asylum was as follows: The boy was stripped and placed standing in an empty bath tub. A basin, or a vessel with a spout to it like a watering can, was filled with cold water and poured over the shoulders and down the back of the subject. In nervous, delicate children, one dash of water was sufficient for an application; in the sluggish, phlegmatic lads, the dose might be repeated. The boy was immediately rubbed down, dressed in night clothes, and put to bed. Sponging the back with cold water does not have the same value as douching.

A few words more in regard to the connection between adenoids and enuresis. Grodich (*Arch. f. Kinderheilk.,* Bd. xx, Heft 3 and 4) thought he had discovered a connection between adenoids and enuresis. In a number of cases in which the adenoids were removed the incontinence stopped. In four cases adenoids reappeared and with them the enuresis. Huber in this country has also written on this subject, and he even suggested some relation between the diminished intake of oxygen in patients suffering from adenoids and the blood supply of the cerebrum and spinal column.

In short, it may be said that the theory of cerebral involvement in enuresis is in the ascendent, and therapy directed to increase the inhibition of the cerebrum is the most rational. The practice of awakening the child at night to empty the bladder does not effect a cure. The child's will must be stimulated to retain it.

In conclusion, I will give the treatment which I have lately followed with considerable success:

1. Two doses of a diuretic during the day; one at 9 a. m. and the other at 2 p. m. Usually I prescribe the alkaline citrates with spirit of nitrous ether, but I have also used caffein and diuretin, and sodium benzoate.
2. Give one dose of atropine at night. Instead of atropine I have used rhus aromatic, also antipyrine.
3. I use Pendergast's method of douching the back.

It is too early yet to speak of the proportion of cases cured and the time which elapses before cure. This I reserve for a future communication.

SOCIETY PROCEEDINGS

BRITISH MEDICAL ASSOCIATION.

Annual Meeting held July 28, 29, 30 and 31, 1903.

SECTION ON PEDIATRICS.

Discussion on the Pathology and Treatment of Chorea. —Dr. D. B. Lees, Senior Physician to the Hospital for Sick Children, Great Ormond Street, and Physician to St. Mary's Hospital, opened the discussion, saying: Our subject is the pathology and treatment of that common disease of childhood which is so inadequately and incorrectly described by the name "chorea." Inadequately, for there is much more than abnormal muscular movement in this malady. Incorrectly, for whatever else a choreic patient may do, there is a total absence of any rhythmic movement which might fairly be described as "dancing." It is most unfortunate that the name should wholly misrepresent the disease. Perhaps, when the pathology is completely understood, a better name may be invented. Meantime let us define our subject by excluding all varieties of hysteria, all forms of habit-spasm, and all irregularities of movement resulting from gross cerebral lesions, such as athetosis and "post-hemiplegic chorea." And in this section we neglect the rarer chorea of adults and of old age, and concern ourselves only with the so--called "chorea" of childhood.

The most obvious fact in chorea is disorderly muscular movement, spasmodic, clonic, irregular, involuntary, with imperfect control and co-ordination. If we observe carefully the distribution of these involuntary movements, we find that it is precisely the muscles over which we have most voluntary power that are most affected in chorea—the muscles of the face, those of the tongue, and those of the hands and arms. These are the muscles which specially express emotion—by grimace, speech, and the movements of the hands and arms which naturally accompany eloquent or excited speech, especially in the more emotional races. It is precisely these muscles which are most affected in chorea; the face, tongue, and hands are much more implicated than the proximal parts of the upper limbs, the upper limbs more than the lower, and the lower limbs more than the muscles of the trunk.

Respiration, over which we have a real though limited control, is affected much more than the action of the heart, over which we have no voluntary power whatever. The heart's action may, indeed, be irregular in chorea, but it is much less so than the respiration, and the heart often works steadily enough while the breathing is quite irregular. Choreic movements are often more pronounced on one side of the body than on the other, and in slight cases they may be limited to the limbs of one side. Choreic movements cease when the patient falls asleep, and recur when he wakes.

These facts, taken together, indicate unmistakably a disorder of the brain, and specially of the motor centers. In the Rolandic area of the cortex much space is allotted to the movements which are specially under voluntary direction and control—to the face, hand and arm—less to the lower limbs in proportion to their size, and comparatively little to the muscles of the back and of the abdomen. The relative affection of the different muscular movements in chorea corresponds to the cortex arrangement.

It is clear that in chorea these centers are in an abnormally excited case, for if you ask a choreic child a question, its hands will often reply before its mouth. Place the child at rest, with its arms and hands outstretched on the bed, and wait for a quiet interval when the choreic movements have ceased, or are at all events much diminished. Then ask the child a question, however simple, its name, or the number and names of its brothers and sisters. Usually the choreic movements recur at once in the hands, often before the reply is uttered, or if they have not previously ceased, they become very rapidly much more violent. It seems that the outgoing impulse to the speech center finds the adjoining centers of the motor area abnormally excitable, and overflows into them. Sometimes the choreic movements follow so quickly after the question that it almost seems as if the ingoing auditory impulse had reached them directly.

Similarly, if the child squeezes an object firmly with one hand the other hand usually becomes more decidedly choreic. In a case of hemichorea, a strong squeeze with the unaffected hand brings out additional movements in the choreic hand, while a squeeze with the affected hand produces little or no effect on the other. This seems to indicate clearly that the hand center in the cortex on the one side is more excitable than that on the other.

The motor centers are not only irritable, they are also weak. This weakness may be obvious from the first, but it is apt to become greater as the irritability subsides. The grasp is feeble, and the weakness of the whole upper limb may be so great as to deserve the name of paresis. When the hands and arms are outstretched, the child standing or sitting, there is usually a slight flexion of the wrist, apparently due to loss of tone of the special extensors, and the voluntary extensor effort of the common extensor of the fingers slightly overextends the first phalanges. It may be impossible for the patient to walk, to stand, to rise from the recumbent position, almost impossible even for him to lift one leg over the other.

In a severe case the weakness of the tongue and lips is great, so that feeding is difficult and speech becomes too great an effort. The laryngeal muscles may share in this weakness. But often there seems to be something more than mere weakness of the muscular mechanisms involved in speech, for, though these muscles are never completely paralyzed in chorea, speech may be altogether lost for weeks, or even for months. I have seen several cases in which speech was impossible for six or eight weeks, and one case in which it was absent for eight months. This child made at last a complete recovery, and she was subsequently in the same ward for another but slighter attack of chorea, in which her speech was not impaired. In such cases it is impossible to resist the belief that the motor speech center is itself affected. Thus we have an indication that the muscular movements and weakness are not the only evidence of a disorder of the brain in chorea. This inference is often confirmed by the very first attempt at conversation with a choreic child, for even the most kindly question will sometimes provoke an emotional storm. The child begins to cry without any obvious cause; this may pass away quickly, or the crying may become violent. When it has ceased he cannot tell you why he cried, and he will sometimes acknowledge that there was nothing to cry for. Such attacks may be accompanied by great excitement, and even by hallucinations of vision; they then fairly deserve to be called maniacal. In the absence of emotional attacks there is often a listless vacant look on the face of a choreic child which in health was alert and intelligent. This may be due in part to weakness and loss of tone of the facial muscles of expression, but it is probably also the result of a mental dullness caused by the disease; for mental dullness and loss of memory are often obvious enough. The answers to the very simplest questions in mental arithmetic are often absurdly wrong; and when the child is asked to repeat the alphabet, one or two letters are frequently omitted. Alterations, also, in temper and disposition are often complained of by the mothers.

Whether there is impairment of the sensory activities of the brain, general or special, it is difficult to say. Choreic children are not often definitely hyperesthetic, and marked anesthesia is not a symptom of chorea, though it may occur in older children who are also hysterical. Possibly there is sometimes a general lowering of sensibility.

Thus it is clear that in chorea much more than the Rolandic area of the cortex is affected, and it is probable that the whole brain suffers more or less. Is the cord affected also? If so, its affection is overshadowed by that of the brain, as in tuberculous meningitis. But one phenomenon is observed which may indicate an extra irritability of the spinal ganglion cells—an increase in the briskness of the knee-jerks and a tendency to a prolonged extension of the knee when the patellar tendon is struck. Possibly also the atonic condition of the wrist extensors may be of spinal origin.

Are the peripheral nerves affected? Choreic children sometimes complain of flying pains in the limbs, away from the joints, which may possibly be neuritic. In some cases of chorea the knee-jerks cannot be obtained, though it is not certain that this is really a symptom of the disease, or how, if it is a symptom, it is produced. And the occasional occurrence of slight optic neuritis, mentioned by Sir William Gowers, must also be remembered. It may be added that choreic children often suffer from constipation; the cause of this is uncertain. In chorea, then, there seems to be a disorder of the whole cerebral cortex, probably of the whole brain, possibly of the nervous system in general, sufficient to produce very definite symptoms, and often lasting for a long time. Yet the disorder is not a destructive one; it usually ends in complete recovery. The pathological changes are, therefore, if organic, of slight intensity, and it seems probable that the morbid state may be largely due to a toxemia. Yet the fact that the symptoms may be very definitely localized suggests that the cause cannot be simply a toxemia; there must be something focal as well. The changes found *post mortem* in the brains of the few cases which end fatally have been mainly confined to the vacular system—hyperemia, dilatation of vessels, perivascular leucocytes, thromboses, and slight hemorrhages. Alterations in the nerve cells have also been found by several observers. A recent investigation of two fatal cases by modern histological methods by Dr. Reichardt of Chemnitz showed small hemorrhages, irregularly scattered, with collections of leucocytes, chiefly mononuclear, and dilatation of the vessels, with perivascular small-celled infiltration, in many parts of the brain, in varying amount. No changes were detected in the ganglion cells, but there were areas of fatty degeneration of nerve fibers; in the spinal cord the parts most affected were the root fibers and the anterior and lateral horns, and the posterior columns —the anterior and lateral tracts were free. Cultures from the fluid of the cerebral ventricles of the first case gave no result, but "staphylococcus aureus" was obtained from the heart blood. In the second case there were "streptococci" in the cardiac valves, and a few colonies of "staphylococcus albus" were obtained from the brain.

If we look for clinical evidence of a morbid blood-state in chorea, we find that it is frequently accompanied by manifestations of the toxemia which we call "rheumatism." Any of the ordinary rheumatic phenomena in a child may accompany chorea—tonsilitis, arthritis, erythema, nodules, cardiac dilatation, endocarditis, pleurisy. The most frequent of these is cardiac dilatation, for in chorea, as in rheumatism, the left ventricle is almost always too large, the left border of the heart extending beyond the left nipple line, often as much as one finger breadth, and the first sound being feeble. The next commonest is a systolic apex murmur: whether this is always due to valvulitis is uncertain, but in many cases it is so undoubtedly. In almost all fatal cases of chorea recent vegetations are found on the mitral valve. A fairly frequent evidence of rheumatism is the rheumatic nodule, single or multiple. The neighbohood of the various joints, also the tendons of the hands and feet, the occiput, and the vertebral spinous processes ought to be carefully examined for nodules in all cases of chorea. The other manifestations of rheumatism must also be borne in mind, and special care should be taken not to overlook a pericardial rub.

With regard to the relations of rheumatism and chorea, I may repeat what I wrote in my article on rheumatism in Allchin's *Manual of Medicine:* "The relationship between the two affections needs further elucidation, but the more carefully they are studied, the more intimate it is found to be. Choreic symptoms of slight intensity are common in children suffering from acute or subacute rheumatism; and when there is no definite chorea there may sometimes be seen the tendency to emotional disturbance—the causeless and transient fits of crying which are so often observed in chorea. The onset of a severe chorea frequently follows two or three weeks after the occurrence of symptoms which, though slight, were definitely rheumatic. During an attack of chorea undoubted symptoms of rheumatism may manifest themselves. Many cases of chorea which have apparently at the time no connection with rheumatism suffer from an attack of that disease a year or two later. After making allowance for possible coincidences, the conclusion is irresistible, that there is some very close connection between the two diseases, and that in many cases chorea must be looked upon as a definitely rheumatic symptom."

I draw special attention to the fact that chorea is often the first of a series of rheumatic attacks. If this be ignored, and the relationship of the two diseases be based simply on the precedence of rheumatism, the connection of the two will inevitably be understated. It occurred to me that it would be worth while to investigate carefully the amount of subsequent rheumatism occurring within a few years after an attack of chorea in children who had had no rheumatism previously. Dr. Batten was good enough to investigate this point in the out-patient department of the Hospital for sick children.

He found in 115 cases of chorea that whereas the percentage of previous rheumatism was stated to be only 32.2 per cent, three years later so many of them had subsequently suffered from rheumatism that the percentage rose to 43.5, and three years later still it had risen to 53.2, so that the lapse of six years had increased the percentage by 21 per cent. And this is below the truth, for after the lapse of six years as many as 38 of the 115 children could not be investigated. If the same proportion of these missing ones had become rheumatic, the percentage would be increased, not by 21, but by 28 per cent. This added to the cases of "previous" rheumatism would give a total percentage of 60 per cent. And even these figures are probably too low. When we remember that pain and swelling of joints, which alone constitute the ordinary idea of "rheumatism," are slight and infrequent in the rheumatism of childhood, and that its sole and yet conclusive manifestation may be a subcutaneous nodule, or a small patch of erythema, or a dilated heart with a soft mitral murmur, one sees that statistics which are to represent fairly the relation between the two diseases must be made with the greatest care. All the points mentioned by Dr. Cheadle in his Harveian lectures must be borne in mind. For these reasons many published statistics on the connection of chorea with rheumatism greatly understate the facts.

The clinical evidence is in reality very strong, and we turn with interest to the excellent work of Drs. Poynton and Paine on the bacteriology of rheumatism to learn whether they can throw light on the pathology of chorea. I need not remind you that these observers, by a series of investigations, have isolated from the tissues in cases of fatal rheumatism, and also from the blood of rheumatic patients during life, a diplococcus which they have been able to cultivate. and which when injected intravenously into rabbits has produced in them all the symptoms of a violent rheumatism in a child, and that a recent subcutaneous rheumatic nodule, excised with aseptic precautions two hours after death, at once immersed in a suitable medium and cultivated for forty-eight hours in an incubator, was found to contain an exuberant growth of this organism without the presence of any other. In my judgment these results are decisive. Accepting then the fact as now demonstrated that rheumatism is a disease caused by a diplococcus, and remembering its close clinical connection with chorea, we ask with interest whether this diplococcus is also responsible for the production of chorea. The evidence on this point is as yet scanty, but it is extremely suggestive. One of the rabbits injected with a culture of this diplococcus obtained by incubating pericardial fluid from a fatal case of rheumatism, developed symptoms remarkably resembling chorea in a child—clonic, irregular, involuntary, spasmodic, muscular movements, especially of the forelimbs and of the face, with a condition of "nervousness" such that it started at any sudden noise. This rabbit was killed, and diplococci were found in the lymphatic sheath of the vessels in the pia mater and in the endothelial cells of the blood capillaries penetrating the cortex of the brain.

A second fact is this. Dr. Poynton cut sections of the brain of a fatal case of chorea which had been preserved for three years, and found diplococci in the cortex itself, also in profusion in the mitral valve. These, however, were not cultivated, so that it is not proved that these were the rheumatic diplococci. Yet if we take these two facts together, and remember that Dana, Apert, Wassermann and others have isolated a diplococcus from the brain in fatal cases of chorea, it becomes more than probable that before long the demonstration will be made complete. Fatal cases of chorea are happily uncommon, and it will require some time before the point can be proved.

But if it has been shown that these diplococci are almost always found in the heart in fatal cases of rheumatism, and if they have actually been found in the blood during life, it seems certain that they must often reach the cerebral circulation. If their presence in the pial vessels and the cortex is the cause of chorea, we must look upon this disease as a microbic invasion of the brain, as in tuberculous meningitis. Why the result is so different in these two diseases must depend upon a difference in the virulence of the microbe, and the different measure of resistance on the part of the phagocytes and other defensive mechanisms. In this respect some recent observations by Drs. Poynton and Paine are of interest. They found that in the arthritis of rheumatism the fluid effusion is usually sterile; that the diplococci are present in the synovial membrane of the inflamed rheumatic joint, but that they are seized upon by the phagocytic cells, and that the diplococci contained in these cells are so much devitalized that they can no longer be cultivated.

Why the rheumatic diplococci should cause chorea in children and not in adults; why some rheumatic children should become choreic and others not; and why girls should be choreic three times as frequently as boys, must depend upon differences of individual power of resistance. Even if the actual presence of the microorganisms cannot be demonstrated in the cerebral blood vessels and membranes in fatal cases of chorea, it is still possible that the "irritable weakness" of the cortical cells may be due to poisoning by their toxin, just as the toxin of the diphtheria bacillus selects certain parts of the central nervous system. If the toxin alone is the active agent the analogy would be with diphtheria; if the organisms themselves are present in the cerebral membranes the analogy would be with tuberculosis. A similar doubt exists with regard to the dilatation of the left ventricle caused by rheumatism —is it always due to the presence of the diplococci in the cardiac muscle, or may the toxin alone be sometimes effective? The decision of this question must be left to future research.

Are we then to say that chorea is "cerebral rheumatism"? Yes, if we add "in the great majority of cases." But we must not make the statement absolutely, for other microbes and other toxins may perhaps affect the cortical cells in the same way as the rheumatic diplococci and their toxin, just as the bacillus coli and the bacillus enteritidis of Gaertner may produce a continued fever resembling that caused by the typhoid bacillus; and, to say nothing of "senile chorea," the disease known as Huntingdon's chorea is found to be caused by multiple organic sclerotic changes in the cortex. It is even possible that the sudden emotional disturbance caused by fright may in some way disturb the nutrition of the cortical cells in a susceptible brain in a way similar to the altered nutrition caused by the rheumatic toxin. Sir William Gowers reminds us that throughout the animal kingdom the emotion of alarm has a direct effect on the motor centers essential to the safety of the animal alarmed. Cases of chorea really caused by fright in the absence of rheumatism are rare, but they probably exist; the difficulty is to prove the absence of rheumatism.

I desire then to maintain that every case of chorea, however mild, ought to be looked upon as presumably rheumatic. And when we remember the danger of untreated rheumatism in a child, and the heart disease which it so frequently causes, we see how great an injury one may do to a child by neglecting a slight chorea. Many a mitral stenosis in later life, with its distressful years and its premature death, might have been averted if the practitioner who attended the case of slight chorea in childhood had treated it vigorously as rheumatic.

If, then, in the majority of cases chorea means a brain infected with rheumatic diplococci, surely the treatment which cures rheumatism ought to cure chorea. Yet it is not the general experience that much has been effected in this way. May not this be because the doses given have been too small? If one wishes to cure a cerebral syphilis, large doses of iodide must be employed. Acting on this idea, I have lately given to cases of acute chorea large and frequent doses of sodium salicylate, to which invariably has been added twice the amount of sodium bicarbonate. This addition of alkali I think of great importance, from more than one point of view. In a considerable number of cases this treatment has produced a very rapid improvement. The plan is certainly deserving of further trial in acute chorea. Success seems to depend upon the amount given daily, a further improvement sometimes following each increase of the dose. That the improvement is not due merely to the rest in bed, nursing, and feeding, has been proved in some cases by allowing three or four days to elapse before administering medicine. Some cases grow worse if left untreated, others improve slightly.

The dose of sodium salicylate for a child of six to ten years should be at first 10 gr., with 20 gr. of sodium bicarbonate. After two or three days the quantities should be increased to 15 gr. and 30 gr. respectively. After two or three days more they may, if necessary, be increased to 20 gr. and 40 gr. These doses should be given every two hours during the day, and every three hours during the night, ten doses in the twenty-four hours. Thus the total amount of salicylate given at first is 100 gr. daily, increased to 150 gr., and finally to 200 gr.

A careful watch must, of course, be kept for any symptoms of salicylate poisoning, and especially for a peculiar deep respiration simulating the "air-hunger" of diabetes. If this occurs the medicine must be immediately given up, for it is a sign of danger. It is, however, a rare phenomenon. There is some reason for thinking that it is really an acid poisoning. The similar air-hunger of commencing diabetic coma may sometimes be arrested by large and frequent doses of alkalies, and the only fatal case of salicylic air-hunger that has come under my own observation had taken the salicylate without any additional alkali. Air-hunger began to show itself in one case which I treated with aspirin instead of salicylate, without alkalies, and disappeared when the drug was omitted. It seems to me very important that each dose of salicylate should be accompanied by twice as much bicarbonate.

The unpleasant symptoms sometimes caused by salicylates in adults, the deafness and noises in the ears, the headache, the mental symptoms and delirium, are exceedingly rare in childhood. Occasionally vomiting is troublesome, but it may usually be overcome by suspending the treatment for a few hours and then beginning again with a smaller dose, which should be gradually increased. Pulse failure occurring during the employment of salicylates, both in children and in adults, is generally not due to the remedy, but is caused by an acute rheumatic dilatation of the left ventricle—a common, but usually overlooked, phenomenon in rheumatism. Careful observation of the position of the border of the left ventricle, as ascertained by accurate light percussion, should be made daily. As to any general "depression" from the salicylate, in children it is usually quite absent; indeed, it has been remarkable how much brighter and more lively the patients have become during the treatment. It should be added that the large doses of bicarbonate do not impair appetite or disturb digestion in rheumatic children, and that, in spite of them, the urine often remains acid for a considerable time. Albuminuria is not caused by the treatment above advised.

Every choreic child should, I think, be kept for a time completely at rest in bed, however mild the chorea may be. If there is much tendency to excitement, restlessness, or emotional attacks, complete isolation is very helpful. A cot with padded sides is necessary in severe cases, and the most careful and efficient nursing is essential. It may be needful to give in such cases hypnotic drugs, as chloralamide, chloral, or bromide, the first night or two, to secure sleep, but in many cases these can be avoided if large doses of salicylate and bicarbonate are used. The diet at first should be of milk only.

In acute cases this treatment is often very successful. The time at my disposal will not allow me to give details of cases, but I will briefly mention one as an illustration.

J. S., aged seven years, was admitted into St. Mary's Hospital on July 3, suffering from general chorea of moderate severity. She was kept in bed for six days without any medicine. During this period her chorea became distinctly worse. On July 9, the movements being more choreic than on her admission, 15-gr. doses of sodium salicylate with 30 of bicarbonate every two hours during the day and every three hours during the night were ordered; the total daily dose being 150 gr. of the salicylate and 300 of the bicarbonate. This treatment was continued for six days. Some vomiting was caused by this abrupt introduction of very large amounts of salicylate, and three or four doses were omitted in consequence. On July 15, after six days of this treatment, the inspiration seemed to be abnormally deep, and the salicylate was stopped entirely, while the bicarbonate was continued. But already the choreic movements had very much diminished. On July 18 hardly any could be seen, and on July 22 the child was perfectly quiet, except that there were very slight movements in the fingers when she was spoken to.

It is usually advisable to begin the treatment with smaller doses, which often cause no vomiting at all, but in this case a large initial dose was purposely employed, as a test, and the result was most remarkable.

I could give other cases almost as striking as this, and now feel confident that this is the most successful treatment for acute chorea.

In chronic cases one would not be surprised if the effect of this (or any other) treatment is less certain, for even though the microbes may be destroyed and their toxin neutralized, the cortical cells may possibly remain for some time in a condition of irritable weakness. It is not always possible at once to get rid of an effect by removing its cause. Where the cortical centers have been severely effected, time may be an essential factor in their recovery. Prolonged rest and the gradual introduction and increase of the stimulus of voluntary action may be necessary. Yet even in chronic cases I have seen remarkable benefit. For instance, in a case treated recently by 10 gr. of salicylate and 20 gr. of bicarbonate every three hours improvement to a certain extent resulted, but not a complete cure. Large dozes of liq. arsenicalis were given for a few days, but no good result followed. Then the salicylate and bicarbonate were given again in larger doses, 15 gr. and 30 gr. respectively, and very soon the chorea had ceased entirely.

(*To be continued.*)

EDITORIAL

CHOREA.

Chorea is recognized to be a by no means uncommon nervous disease of childhood, and there seems to be reason for believing that it is somewhat on the increase. Although statistics are lacking, it would seem that the disease is by no means as frequent in this country as in European countries, yet its incidence in the larger dispensary clinics is sufficiently great to call attention to its occurrence and to stimulate investigations bearing on its etiology.

One of the most recent contributions to the statistical side of the question is furnished in a short report of the work of a neurological dispensary clinic, by Drs. Smith Ely Jelliffe and L. Pierce Clark (*Journal of Nervous and Mental Disease,* August, 1902). They show that in Dr. Starr''s clinic for the year 1902 that of the 1780 new patients who applied for treatment at that dispensary 135 or 19.5 per cent were cases of chorea, 128 of which were of the usual type of this disease. If chorea should represent, therefore, as much as 20 per cent of nervous affections, it must evidently be an extremely widespread disease.

The discussion on the pathology and treatment of chorea which was held at the seventy-first annual meeting of the British Association, and a portion of which we present in this month's number of Pediatrics, constitutes one of the most important recent additions to our knowledge of this important malady of childhood.

Dr. E. P. Lees brings out, concerning the symptomatology of chorea, that its most obvious characters are disorderly muscular movements which are spasmodic, clonic, irregular, involuntary, and exhibit imperfect control and co-ordination. The muscles which are most affected in chorea are those particularly that are under the most delicate voluntary control, and in view of this fact and of the other attending symptoms, he believes that chorea is unmistakably a disorder of the brain and particularly of the motor centers. If the cord is involved, it is but rare, and only occasionally it is observed that the peripheral nerves are also affected.

The most important trend of thought brought out by this discussion is the probable relationship of this disease to some infectious micro-organism. Not only have Drs. Poynton and Paine isolated a diplococcus from rheumatic cases associated with chorea, but a large number of observers have verified in part the results of these investigations.

It would seem to be fairly well established, therefore, that chorea ought to be looked upon as presumably of microbic origin. Whether the majority of the cases of chorea are to be considered as affections of the brain due to the ordinary organism of acute rheumatism, or whether chorea is to be considered as an affection due to some specific organism, cannot at the present time be definitely settled upon. The value of the routine treatment of rheumatism by the salicylates in Dr. Lees' opinion, is, however, corroborative evidence that the micro-organism is closely related to that of acute articular rheumatism. We can look for some very important advances along this line with such an illuminating discussion as we have here offered.

THE OPERATIVE TREATMENT OF CHRONIC BRIGHT'S DISEASE,

It has become painfully apparent to all practitioners of medicine that during the last ten or fifteen years no advance in the treatment of chronic Bright's disease has been offered. While it is true that we have arrived at more definite beliefs concerning the causative factors, and while we have realized that a great many more cases of kidney involvement are due to the acute infectious diseases, and particularly have we become alive to the realization that acute infantile diarrhœa is responsible for a certain proportion of diseased kidneys, yet beyond prophylactic and dietic regulations the advances along this line have been more conspicuous by their absence than by their presence.

A ray of hope, however, has come across the horizon in the suggestion by Edebohls, Israel and Mayo Robson that the character of the inflammation of the kidney can be altered by surgical procedure. The suggestion of Edebohls to treat chronic Bright's disease by renal decapsulation is still so young, first having been spoken of in the latter part of 1901, that a wise conservatism should control medical opinion with reference to this procedure, and each and every case reported is worthy of the most serious consideration.

Drs. Tyson and Frazier, in the September number of the *University and Pennsylvania Medical Bulletin,* report the case of a little girl nine years of age, who five years before admission to the hospital suffered from scarlet fever. One year later symptoms of acute nephritis developed, which responded promptly to treatment and following which she has had five relapses, each attack proving more perilous than the previous one. On admission to Dr. Tyson's service she was in a very serious condition, and although some temporary improvement followed medical treatment, she became very much reduced in strength and death seemed imminent. She was transferred to Dr. Frazier's service, and in January, 1902, the right kidney was decapsulated. Ten days following the operation, ascites and anasarca disappeared, but there was still a certain amount of albumen, and casts were numerous. Two months later the left kidney was decapsulated and the patient's life was saved. There remained, however, at the time a large proportion of albumen, and the casts, both hyaline and granular, persisted.

Dr. Frazier maintains a very conservative attitude towards the operation, saying that whereas he was primarily very sceptical, the improvement in this case was so striking that he was forced to conclude that one cannot justifiably disregard such results obtained in a patient so desperately sick and without the slightest prospect of recovery.

We believe with him that the operation is justifiable not as an experimental procedure, nor for the gathering of statistics, but when all attempts at alleviating the condition by other means than operation have failed. We believe also with him that it is bad practice to operate on all cases because death seems imminent, and we counsel further study of the operative technic which has by no means been carefully elucidated, if the physiological work of Emerson and others is taken into consideration.

ABSTRACTS

Spurious Tapeworms or Parasitism Due to Undigested Bananas.—Walter L. Bierring (*Iowa Medical Journal,* 1903, p. 281,) says that frequent specimens of discharges from the bowels are submitted to the laboratory of pathology for examination that contain elements resembling some form of tapeworm or other variety of intestinal parasite. As a rule the distinction is readily made when due regard is given to the different forms of undigested particles of food usually met with in the examination of stools. During the past winter though, our attention was directed in two instances to material discharged from the bowels that had a particular resemblance to minute tapeworms and lead to considerable and interesting study before the real nature of it was finally determined. The first sample case from Dr. C. J. Christiansen, of Jewell, Iowa, accompanied the following letter:—

"I have sent you a collection of those intestinal parasites that were referred to in my former letter and will state further that they come from a child two years of age, who has been passing material of this kind for some time but according to the mother, not as frequently now as formerly, as only a few are passed about once a month—about 'two days before the new moon.' The mother states that a day or two before the worm appears in the stool his sleep is much disturbed and he becomes very restless. At present time the nutrition of the child is greatly improved and the nervous symptoms are not very marked. I have tried to pick out the most typical and different forms as they appear in the stools. The stools when seen are covered with the material that I sent you. I have examined some under a small microscope and find that they seem to be connected but the slightest touch seems to cause them to separate. I hope that you will find a name for them." The second example was submitted by our Colleague, Dr. William Jepson, who has observed their occasional occurrence in the stools of a man 38 years of age suffering with a severe anaemia of obscure origin. "The objects in question appeared in considerable numbers and represented dark brown to black fibres which seemed to be segmented like a tapeworm, the mass being made up sometimes of fibres passing in two directions, in that, to fibres or bands placed transversely, numerous lateral fibres were attached on one side resembling a rope curtain-like arrangement as represented by Figure 3 on the accompanying plate.

Microscopically the fibres were made up of small oblong bodies or segments apparently more or less connected and resembling tapeworm strobilæ. At first it was thought to be a form of tænia nana, the smallest variety of tapeworm observed in the human person, but failing to make it correspond to this or any other known form of minute tapeworm and not resembling any vegetable element hitherto observed by us, we submitted some of the specimens to Dr. C. W. Stiles, of the Bureau of Animal Industry, at Washington, D. C., who reported that a closer examination revealed the same to be tissues from a banana, and referred to a recent Bulletin, No. 35 issued by the Bureau in which a similar example of spurious parasitism was described. Upon further correspondence with the attending physician of the first case, the connection with the indigestion of bananas was fairly well established, but in the second instance this relation was not so definitely determined. In order to more definitely establish the relationship, personal experiments were conducted by eating large quantities of bananas and by subsequent examination of the stools finding the material identical with what has been described and which represented the undigested portions of bananas. In studies made upon the banana itself it was found that upon exposure to the light of transverse and longitudinal sections, dark colored fibres or bands appeared along the center and on the external surface which corresponded to the structures just described. The particular structures of the banana were brought out specially well if sections were placed in a five per cent solution of potassum hydrate; the segmented band-like elements which usually resist digestion being separated in this way from the remaining substance of the banana and also assuming the same dark color and noting when the fruit was exposed to the light or as they appeared when discharged from the bowel. The arrangement of these so-called fibres is best shown by Figures 1 and 2, from which it appears that they are arranged vertically along the center of the banana, and from these radiate horizontally towards the periphery and over the external surface, dividing the banana into three well defined portions. When more closely examined they are found to consist of bands or rows of cells oblong in shape, well-defined in outline, composed of a granular material with occasional opening or spaces evidently due to retractions in the protoplasm. (Figure 4). The cells seem to overlap each other at the ends and so form an apparent connection with each other. According to our Colleague, Professor Schimek, of the Department of Botany, these cells represent the parenchyma cells and the spiral elements noted (Fig. 4-b) between them are the so-called spiral ducts or tracheæ of the banana. Even when magnified the oblong shaped cells bear a striking resemblance both in form and arrangement to the segments of the tapeworm. In sections from the inner part of the peel of the banana cells are observed (Fig. 5) that are smaller in size, of pavement form, which have a tendency to be arranged in rather definite elliptical collections apparently connected to form longitudinal bands. At this point mention should be made of the interesting report presented by Dr. F. B. Wynn, of Indianapolis, before the Section of Pathology at the recent meeting in New Orleans, of a series of experiments conducted with a class of students who voluntarily lived on certain special articles of food as selected from an ordinary bill of fare, and examining the undigested elements as they appeared in the stools; many of the substances so observed, had a very marked resemblance to certain forms of intestinal parasites, which would be very misleading if not properly interpreted. The study of discharges from the bowels is frequently passed over too lightly in the ordinary clinical examination, and yet we must recognize its high importance in all intestinal disorders and some of the obscure anæmias. It is evident though that a knowledge of the elements liable to occur normally in the stools is absolutely necessary in order to arrive at correct conclusions in diseased conditions. Pathological Laboratory, State University if Iowa.

Morphine Poisoning in an Infant One Month Old.—JULIA D. MERRILL, (*The Chicago Clinic,* May, reports a history of Jeanie C., who at birth was a healthy, well-developed child. Owing to the straightened circumstances of the family, the mother took up her household duties before her strength was fully regained. The baby soon began to suffer from colic and was very fretful. One evening, when just four weeks old, she was given by mistake one-sixth of a grain of morphine. This was at ten at night. After a few minutes of further crying the child became quiet. The exhausted mother also fell asleep and did not waken until half-past five the following morning when she was roused by a queer sound made by the baby. This was followed by a convulsion in which she thought the child was dying. The doctor was not at home when the messenger came for her, but a substitute hurried to the case. To her, death seemed imminent, but hoping to stimulate respiration, a hypodermic injection of strychnine (Gr. 1-160) was prepared. While this was being done the child was seized with a convulsion, apparently the death agony. However, the hypodermic was given, artificial respiration was begun and hot coffee injected per rectum. At seven in the morning, or nine hours after the administration of the morphine, the doctor herself took charge of the case and found the following conditions: Complete unconsciousness, tightly contracted pupils, deep cyanosis, moist skin, respirations shallow and four to the minute, pulse weak and reflexes absent. At intervals of three to four minutes there occurred general tetanic convulsions beginning with a weak crowing inspiration, the chest becoming fixed, the whole body rigid, cyanosis extreme and the pulse imperceptible. These spasms lasted from thirty to fifty seconds. As the family asserted this had been the behavior since first discovered at five thirty, the convulsions could not have been due to the strychnia. The interval since the morphine was swallowed was so long and the general condition so depressed, no effort to induce vomiting was made. Any medication by mouth was impossible, a few drops of water, given experimentally, precipitating a convulsion with distressing strangulation. Washing out the stomach was accomplished once but the spasms that occurred during the process were more severe and restoration was more difficult than at any other time. There had been no evacuation of the bowels or bladder since the previous afternoon, hence a high colonic flushing was given and repeated at frequent intervals. After the second irrigation a small quantity of urine was passed and more after each succeeding one. Artificial respiration was kept up constantly for eight hours. Hot baths followed by cold sprinkling, ice to the chest, rhythmic traction of the tongue, irritation of the epiglottis, dilatation of the anal sphincter and rectal injections of coffee were used in alternation over and over again. It was impossible to detect any improvement during first four hours of work. About noon the respirations became a little deeper and increased to ten per minute, and the color improved, although the spasms continued as frequently for two hours or more, gradually subsiding. After three in the afternoon, artificial respiration was necessary only at intervals. The little patient passed from coma into sleep which was not disturbed except to give teaspoonful doses of breast milk and rectal injections of coffee and whiskey. The next day she was nervous, started at the least noise, but did not develop a bronchitis from the use of cold. Her muscles did not seem sore from the prolonged handling, neither was the colic cured. At the end of a week she had entirely recovered and is now (eighteen months later) a healthy and bright child, well developed mentally and physically. The doctor had never before seen convulsions follow opium poisoning nor had she come in contact with records of such symptoms, hence the course of treatment had to be ruled by common sense rather than precept. The child had lived through the night and was making a hard struggle to evercome the effect of the large dose of morphine. Unintentionally this effect had been intensified by the use of strychnine. Atropine or any other alleged antidote for morphine was not considered. There should not be added the additional danger from poisoning by these drugs.

A Case of Diphtheretic Gangrene with Diphtheria of the Ear.—A case of a four-year-old-child sent to the hospital on account of diphtheria is reported by Brunard (*La Clinique*). There was free discharge of pus from the left ear nine days after admission, and several injections of antidiphtheretic serum gave little relief. No Klebs-Loeffler bacillus were found, but staphylococcus was. There was gangrene in the pharnyx, larnyx, and lungs, and necrosis in the bony portion of the Eustachian tube was present two days after the autopsy.

The Final Results of the Bloodless Treatment of Congenital Dislocation of the Hip.—P. Redard (*Zeitschrift für orthopædische Chirurgie, Bd. X., Hft. I,* 1902,) gives a series of statistics based upon fifty cases which have been operated upon during the past four years. Forty-three were cases of unilateral dislocation, while 7 were bilateral. Of the 43 cases a true anatomical reduction was obtained in 14. Ten of these 14 cases were under 7 years of age, and under 7 years more than half of the cases can be anatomically reduced by the bloodless method. The bloodless operation upon individuals over 7 years of age is difficult, and the results less satisfactory, most of the results being transpositions, while in some reluxation occurs. The question of age thus has a most important bearing on the prognosis. The writer advises careful preliminary study of the cases with the X-ray to determine the anatomical conditions and the best position in which to put the leg up. Of the 43 unilateral cases a transposition of the head resulted in 26, and in 3 reluxation occurred, and in 2 of these a second operation resulted in a satisfactory transposition. Of the 7 bilateral cases, 2 resulted in true reduction, 1 in reduction on one side and transposition on the other, and in the other 4, transposition of both sides resulted. No accidents attended the operations and a hæmatoma of the upper part of the thigh was the most serious complication. The fractures and paralysis reported by some writers as following bloodless reduction are due to too vigorous attempts at reduction in older individuals. The bloodless method is not to be practiced upon older individuals with considerable displacement of the head. In 8 of the unilateral cases the functional result was practically perfect, while in 30 it was very satisfactory. In general one can say that good functional results a true reduction in young individuals. In 17 of the cases in which merely a transposition was effected, the functional result was excellent. The writer does not use the Lorenz screw or the Schede apparatus to draw the head down at the time of operation, but advises a preliminary extension with from 10 to 15 pounds of weight in those cases in which there is much shortening and displacement of the head. In mild cases the writer simply makes traction on the leg flexed at right angles to the pelvis and abducts the leg at the same time pressing the head toward the acetabulum by manipulation of the trochanter. Occasionally the closed fist is placed behind the trochanter and is utilized as a fulcrum. After reduction the leg is held in more or less of an abducted position with external or internal rotation depending upon the case and a plaster dressing is applied. The writer in his later cases has shortened very materially the period of immobilization. In certain cases the first dressing is done at the end of one or two months and further immobilization is continued for only two months. In conclusion the writer states that the bloodless method produces a complete cure of many cases of congenital dislocation of the hip. The function is greatly improved, and it is the operation of choice in all children under seven years of age.

Deformities Due to Muscular Paralysis.—TOWNSEND (*N. Y. Med. Jour.*, May 3, 1902) says it is of extreme importance in the prevention of deformity to remember that in the various paralyses, the original lesion does not produce a deformity but only a weakness of the muscles. The causes of the production of deformity are gravity, action of non-paralyzed muscles, arrest of development of tissue about the muscle, results of weight applied to weakened structures and other causes. He describes the more important deformities produced by paralysis of various muscles. In tendon transplantation we attempt to improve position or function, or both. If we desire function, attach non-paralyzed muscles to other muscles, bones, periosteum or soft parts. In the lower extremity the weight of the body should be considered and apparatus used for a long time after operation to prevent recurrence. Also the relative strength of the muscles must be considered. Study the manner in which the various muscles act. "In certain cases the mechanics of motion change, so the relation of power to the fulcrum and the fulcrum to the weight, or the portion moved is entirely unlike the original conditions." Other procedures, as arthrodesis, are advocated. The author believes in great possibilities of tendon transplantation. In the lower extremities the use of braces and after treatment are very important.

On a Case of Complete Fibrous Obstruction (Congenital) of Both Superior and Inferior Venae Cavae.—ALFRED MEYER, New York (*Amer. Med.*, May 30, 1903) reports this condition in a young man eighteen years of age, which has never been duplicated, as is proven by a diligent search of the literature of all countries. Quite a number of cases of complete obstruction of either the superior or inferior vena cava have been published, but this is the first case in which the obstruction involved both cavæ. A very complete account of the casce is given, including the report of the physical examination, the history while under observation at the hospital, a period of four months, the post-mortem findings, and the pathologist's report of findings from microscopic examination of various organs. It is possible that the condition was congenital, for there was no evidence that syphilis was an etiologic factor in this case, there being no sign of either recent or old lues disclosed at the post-mortem examination.

Summer Care of Frail Children.—J. MADISON TAYLOR (*International Med. Jour.*, July, 1903), says that a certain number of children are inherently frail, and demand developmental opportunities at all seasons, but the season of summer offers the best occasion to accomplish good work. During the school period they are kept busy with their mental development and yet some awakening is now to be noticed among teachers as to the needs of physical improvements which should progress *pari passu*. The causes of frailty should be carefully estimated by the physician, and measures adopted to fit varying requirements. Some are inherited and some acquired, and others are both. It is to be hoped that the science of physiology, to which we must chiefly look, will soon throw practical light on the problem of detecting and removing constitutional faults in young infants. Already much has been shadowed forth. Babyhood is certainly not merely a time to be spent in eating and sleeping, though that is of the first importance. The physician must be better taught to note, and be inudstrious in observing the earliest evidences of developmental errors. Through the vasomotor mechanism many, if not most, of these defects can be corrected, which if ignored may prove the foundation of serious organic limitations. Treatment has need to consist of much more than an abiding faith in Providence plus compatible environment and proper supplies of food; it must reckon with mechanical stimulation of circulation and the readjustment of organic blood supply. For older children the question of particularized attention to hygiene must be met for each, and the principles require more than mere routine consideration. When the heart is below par in force and regularity, and exertion is followed by evidences of arythmia, pallor and dyspnea, we must ascertain the causes, which may be due more to an undeveloped segment of the cord than to feeble musculature or peripheral disturbance, toxemic or other. Dullness, sloth or apathy may be due to headaches from eye-strain or earaches, or to adenoid growths in the pharynx, or intestinal derangements, liver impairment, and the like, again dependent upon vasomotor incompetency, and more or less removable. Vague derangements of function may evidence early infection from tuberculosis or syphilis or nutritional diseases, as rickets or scurvy. Always, that infant or child who continues to manifest a low degree of vitality and slackness in play, deserves our tenderest care and most diligent investigation. The first safeguard must be to defend it from fussy parental experimentation and spasmodic overattention. Quiet is the paramount requisite. Next is open-air life—and this does not mean drives and excursions—merely exposure, under reasonable precautions, to sun and light and air. The light of the sun is of first importance; but in certain weather this may be too severe, and the light not directly from the sun is of the greatest value, and for most of the day while awake. During sleep, relative darkness is admissible.

In children lack of vigor, as a rule, indicates a disturbance of nutrition in the segments of the cord whence arises the vascular innervation to the parts or organs most below par. It is of importance to determine accurately which organs are impaired in activity, and supply appropriate treatment which can often be best applied mechanically to the spinal areas through which these can be reached. If the lungs or the heart or the digestive tract are at fault, prompt attention to these will go far toward restoring a balance of vigor to the whole organism. Happily, there are few complications to be met, or old lesions to be reckoned with, in the young. It is unusual to find evidence of antecedent genito-urinary disorders unless infectious diseases have damaged the kidneys. Again the ductless glands are rarely disordered seriously, although lack of development of these important sources of vital secretions may exist and the organism may fail to be supplied with the regulative principles by which the function of symmetric oxygenation is maintained. If so, it is vain to expect much improvement by change of air and scene without adopting local measures to induce thorough blood supply to the defective parts. If the limbs are weak, or the skeletal muscles fail to maintain symmetry or alertness of poise, will soon become ineradicable. The question is: Can these conditions be successfully met and overcome? In my opinion, it is possible to accomplish this in infancy, though the departures from the normal are not then so readily noted until in later years, when, through comparisons with normal activities for the age and size, we can determine their nature and extent. Wherever the physician has full access to the nursery, he should make regular and full inspection of the exposed surface of the whole body, and not wait till ailments bring to his attention alterations in structure. A careful examination of the back will give the practised eye and hand much information. The muscular tonus or nutrition, the consistence and quality of the tissues in the region supplied by the posterior primary division of the spinal nerves and their analogues in other regions, should make much clear. The hygienic measures which should supplement mechanical treatment consist, in the order of their importance, of the following points. Abundant quiet, no over-zealously supplied amusements, but good climatic conditions and opportunities for slow observation of natural objects. Next, suitable food supply, which again is best taken alone or with the nurse and possibly other children; not with the adult members of the family, and never at a large hotel table, at least until strength is restored in sufficient amount to have enough to waste. Light and air at all times should be too much, rather than too little, though the attempts at hardening the constitution by exposure must be of the slowest and most cautious. Clothing should be rather too little than too much. If quick temperature changes occur they must be met wisely, and especially if the legs are bare, these should receive prompt covering as cold approaches. While in action the less garments which burden the child the better. No clothes should be worn which require to be saved from dirt and dust. The feet should be freely aired by frequent changing of the footgear, and canvas or other permeable material is far better in summer than leather, and to go barefoot at time is of real value. The care of the skin is of great importance, and here much bathing is not as good as plentiful friction. If the skin be, as often happens in frail children, dry and harsh, the use of inunctions of cocoa butter, olive oil or refined lard oil makes for much good. When overheated by exertion it is of the greatest importance to loosen the clothing and rub the back dry. If the underwear is wet a change is needed.

Nothing can surpass in value opportunities to work in a garden, to dig and delve in the earth, especially where the stimulus is added of watching the progress of growing plants which are the private property of the child. Full freedom should be allowed the child to sit and roll in the wholesome earth unless dampness is excessive. If sleep or weariness overcomes the child, the attendant should have at hand a thick rug or blanket on which it may lie to rest and drowse. A bit of woodland, however small, is almost equally good, or the sands of the shore where forts and other mimic structures can be built, is excellent. If there be enough of spontaneous energy to do this work industriously and to use the limbs with accuracy, all is well, but if not—and it is often so—there comes a most important consideration, and that is motor education. It is true that a perfectly healthy child, abounding in normal impulses, can assuredly be trusted to follow healthy instinctive inclinations, and, given adequate opportunity and wholesome environment, will progress steadily into symmetrical adultism. But how many of our dearest and closest are so equipped primarily? The question is: How many adults of our family and friends are models of physical perfection? Clearly, motor training is of importance to each and every child. As John Fiske has pointed out most forcefully, the very length of babyhood and the slowness of human development is our highest prerogative, leading to perfection and specialization. Waiving argument, then, let me urge the paramount importance of early and scientifically correct motor education from the cradle to the grave. For the frail children this is especially important, because in them spontaneous impulses may leave much to be desired. Also, the motor machinery may be more or less handicapped in countless directions, and demand judicious direction and encouragement. Nothing is so unfortunate as a stupid caretaker. The valuable time of plasticity, which rapidly lessens, must be utilized. A healthy nurse of good simple judgment is not so hard to find. A parent ought to be able to supplement the motor education wisely. Faults of coordination are easily induced by organic limitations, as of bad eyes or weak asymmetric muscles, and suddenly it may be found that deformities are being established most difficult to overcome. To detail how these conditions can be met would warrant long teaching, and while there is endless rubbish extant written about physical training, from the midst of these florid articles sound principles can yet be learned. It is well worth the attention of physicians and parents. The summer affords the best time for parents to fulfil this duty, for they are often then at relative leisure, and no single item of betterment can be indicated more likely to repay their thought and effort.

Two Cases of Polyarthritis of the Type First Described by Still, with Remarks on Rheumatoid Arthritis,—ROYAL WHITMAN (*Medical Record,* Vol. 63, No. 16 p. 601 . In 1897 G. F. Still of London, published an account of a chronic joint disease occurring in children, the onset of the infection being usually insidious. The disease was progressive and associated with enlargement of lymph glands and spleen. The joints most often involved were knees, wrist and spine, the smaller joints of the hands and feet not being affected. Early wasting of the muscles, waxy pallor and anemia with the joint symptoms, however, were the most prominent. In one case of Whitman's the illness began with the involvement of the knee, which led to the clinical diagnosis of tuberculosis. All the larger joints were involved, only the sternoclavicular, fingers and toes, lower jaw and spine being free from the disease. Gradually all the other joints became diseased, the course of the malady lasting over several years, finally resulting in death. Both knees were operated upon with some relief, as was one, wrist which joint was found to have some erosive surfaces the bones being imbedded in a mass of granulation tissue. It was impossible to close the wound, as the skin was so thin and ill-nourished that sutures would not hold, which fragility was increased by a scaly eruption of an obscure nature. At the autopsy the liver was found to be about three times its normal size, presenting marked amyloid degeneration, the spleen also enlarged and soft, the kidneys enlarged with parenchymatous degeneration, mesenteric and other lymph glands enlarged with amyloid degeneration, while thoracic organs were practically normal. The spongy portion of the long bones was uniformly dark red in color, the structure, however, firm and regular. The second case was similar in all respects as regards the joint involvement, emaciation and abdominal enlargement, but after 18 months he began to improve.

PEDIATRICS

Vol. XV. NOVEMBER, 1903 No. 11

ORIGINAL ARTICLES

A REVIEW OF RECENT LITERATURE ON DIPHTHERIA[1]

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DIAGNOSIS.

Although there has been nothing of very great originality on the subject of diphtheria published during the last twelve months, still a considerable number of interesting articles have appeared. The question of diagnosis is discussed very fully by Marfan (*Gazette des Hôpitaux,* March 14, 1903). His very interesting paper commences with a discussion on the value of bacteriological diagnosis. It is admitted that a single culture does not give an infallible result. Again, there is the difficulty caused by the pseudo-diphtheria group of bacilli. Grancher, another great French authority, is quoted as going so far as to say that bacteriological diagnosis is neither quicker nor surer than clinical diagnosis. With a view of obtaining light on this vexed question, Marfan has utilized the large amount of material afforded him by the diphtheria wards of the Enfants Malades, of which he has been in charge for two years. Over two thousand cases have been bacteriologically examined, and the results have been compared with the clinical features of the cases. Where any doubt existed, animals have been inoculated, and the results of inoculation have been controlled, when necessary, by the injection of antitoxin into the inoculated animal. The conclusion arrived at is that there is much less discrepancy between clinical and bacteriological results than is sometimes asserted, and that this discrepancy is often due to errors on the part of the physician or bacteriologist.

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[1] *The Practitioner,* October, 1903.

As a general rule the diagnosis can be made clinically, if not with absolute certainty, at any rate with a probability which amounts to almost the same thing. As to bacteriological diagnosis, while it may not be absolutely infallible, yet if performed with due care and by an expert, it nearly always settles any doubt left after a clinical examination. Except, therefore, in very rare instances, it is easy to decide whether to give antitoxin, without waiting for a bacteriological examination.

On the question of clinical diagnosis, Marfar discusses at length the appearances of different kinds of sore throat. He does not appear to believe in a simple catarrhal diphtheria, the "diphtheria without membrane," which is now usually described in the text-books. The arguments adduced for its existence are, he points out, first, that in cases of laryngeal diphtheria, bacilli are found in the fauces which may be only slightly injected and show no membrane; and, secondly, that every diphtheria commences with an initial erythematous stage before the membrane appears. As regards the first argument he says, very justly, that the bacilli are probably coughed up from the larynx, and that it does not follow that faucial diphtheria exists at all; and, as to the second point, he has not in his experience met with red and injected throats, which ultimately took on an appearance of false membrane, except in the case of scarlatina. In the presence, therefore, of what he calls *"une angine rouge"* he thinks that the physician may safely dismiss the idea of diphtheria from his mind. A more difficult question is that of the combination of diphtheria with scarlatina. Marfan considers that the scarlatinal throats which present a pseudo-membranous appearance are rarely diphtheritic, and that in any case a bacteriological examination is required to make a diagnosis. The result of this may be waited for safely without injecting antitoxin, provided that there is only slight adenitis, that there are no nasal or laryngeal symptoms, and that the patient has not been exposed to diphtheria. In such cases it would be necessary to give the serum at once.

Another interesting point is, how far can true diphtheria assume the appearance of a follicular tonsillitis. Most physicians who have seen much diphtheria will agree with Marfan that certain true cases, especially when the larynx is involved first, do present such an appearance. In his wards he found that 80 per cent. of the cases of follicular tonsillitis accompanied by laryngitis were diphtheritic, whereas under one-half per cent. of follicular cases with no laryngeal symptoms were found to be diphtheria. In a case of doubt it will always be found that the exudation tends to spread over the surface of the tonsil very rapidly, if diphtheritic; and if such a spread does not occur in 24 or 48 hours, a negative diagnosis can be safely made. As long as the condition remains follicular, it is quite unnecessary to give antitoxin, always provided there are no nasal, laryngeal, or marked glandular symptoms, and that an epidemic is not present.

Marfan's general conclusions are briefly as follows: A throat which shows any false membrane must be considered as diphtheritic, and treated as such, unless it occurs in the course of convalescence from scarlatina, or follows a herpes or syphilis of the pharynx, or a tonsillotomy, or a cauterization of the throat. Even in the latter cases it is wise to make a bacteriological examination. Secondly, if the pseudo-membranous condition complicates scarlatina, syphilis, or herpes, if the condition seems follicular or is ulcerative, he concludes that diphtheria is improbable. The presence, on the other hand, of laryngeal or nasal symptoms should lead to a positive diagnosis, even in very unsuspicious throats. In young children white patching of the throat is usually diphtheritic. In all doubtful cases inject antitoxin.

The article, it will be seen, is nearly above criticism, the one unsatisfactory part about it being the lightness with which the writer seems to regard the probability of a concurrence of scarlatina and diphtheria. Such a coëxistence of diseases is seen only too frequently in our own hospitals, and diphtheria may complicate any stage of scarlatina. On the other hand, it must be frankly admitted that many scarlatinal throats are extremely like those seen in diphtheria, and yet are not often followed by paralysis.

Two other papers of interest refer to questions of diagnosis of diphtheria. Dr. Foord Caiger (*Clinical Journal,* Dec. 31, 1902) has not nearly the same confidence in bacteriological examination as the French observer quoted above. He points out that not only do we come across typical, and even severe, or fatal attacks with clinical appearances distinctive of diphtheria, in which careful and repeated examination of the throat and secretions fails to reveal a single diphtheria-bacillus, but, on the other hand, it is not uncommon to find virulent bacilli in the throat-secretion of perfectly healthy persons. In a series of 140 cases of scarlet fever examined bacteriologically by Professor Sims Wodhead a large proportion were found to contain diphtheria-bacilli. Ranke, of Munich, moreover, states that 52 per cent. of his scarlatinal throats contained the bacillus in question. In the rhinorrhea of scarlet fever the presence of the bacillus is also common. While such persons may be a danger to the public, they are certainly not suffering from diphtheria. On the other hand, a positive bacteriological examination of a throat presenting definite follicular exudation, or from the larynx in a case of croup, even without visible faucial exudation, may be taken as sufficient evidence of diphtheria. In the case of a negative examination of a case in which the clinical features point to diphtheria, it is wiser to ignore the bacteriological evidence altogether.

In connection with such cases as Caiger here mentions, it would be a great advantage if hospital statistics of diphtheria discriminated between those cases in which there is merely a positive bacteriological report and those in which the clinical symptoms are in reality those of diphtheria. Last year I admitted into the Edinburgh City Hospital some 15 or 20 cases from a children's hospital, in all of which bacilli were found in the nasal secretion, but none of whom suffered from diphtheria. I could have decreased my death rate appreciably for the year had I classed these cases as diphtheria; they were all notified as such. It would be interesting to know in view of the very low death rates of some institutions, if such cases are shown as diphtheria in the statistics. While no doubt a fever-hospital may be a very suitable place for them, they are in my opinion certainly not cases of diphtheria, and again, if I isolated every case in the scarlatina wards in which bacilli was found, half the patients would probably be isolated, which would be manifestly absurd. In my experience they are seldom a danger to others. Indeed, it almost is coming to this, that without inoculation experiments, a bacillus means little or nothing, and inoculation experiments require time. In conversation with physicians in charge of large numbers of diphtheria cases, I usually find that they diagnose a case clinically, give antitoxin, and do not pay too much attention to the bacteriological report.

But to return to Dr. Caiger's paper: he speaks favorably of the direct cover-glass preparation from the throat swab. There is no doubt that with a little practice much can be learned by such an examination, as it gives the relative number of various organisms in the throat; and if, as he recommends, Neisser's double stain is used, the identity of the diphtheria bacillus is practically assured. In reference to this method, we may remark, however, that Wicliffe Peck (*Lancet, January* 10, 1903) considers that it has a very limited value, not being reliable in more than 60 per cent. of swabbings. He has therefore tried staining with Löffler's methylene blue, 3 to 4 seconds, with Neisser's brown (0.2 per cent. aqueous solution), 30 seconds, as a counter stain, and has obtained much better and more reliable results.

In very much the same spirit Ball (*Annales de Médecine et Chirurgie Infantiles,* June 1, 1902) complains that clinical signs are not studied as attentively as they used to be. There is too great a tendency to throw a hurried glance at the throat, and then to wait for a bacteriological report. On the other hand, it should be remembered that clinical diagnosis is as important as ever, and has also the advantage that it can be made on the spot. In all but very mild cases, when there is any doubt clinically, it is necessary to use antitoxin without waiting for the report. In all cases of croup the serum should be injected at once.

We have seen above that Marfan is inclined to throw doubt upon the existence of a "simple catarrhal diphtheria." This is not the view of Josias and Tollemer (*Annales de Médecine et Chirurgie Infantiles,* 1st November, 1902), who give an account of 709 children admitted in one year to the Bretonneau hospital as suffering from diphtheria. They class their cases as bacteriological and clinical diphtheria respectively. Under the first head are 44 cases in which the clinical appearance was that of a simple catarrhal sore throat, occasionally purulent, but never membranous, and in which the Klebs-Löffler bacillus was present. Such cases, if not promptly treated, may in their opinion take on a membranous character. In other instances they may depend upon a low degree of virulence on the part of the bacillus or a high resistance on the part of the child. All the same, the writers seem doubtful whether such cases should be called true diphtheria. They account for the large number observed by the fact that the relatives of the clinical cases were bacteriologically examined, and if the bacillus was present, were admitted to the hospital. As regards the clinical cases, interesting figures are given showing the death rate according to the bacteriological examination. Of 178 cases in which the bacillus only was found, there were only 7 deaths, a rate of 3.93 per cent. Of 131 cases in which, besides the bacillus, other organisms, streptococci, staphylococci, pneumococci, and colon-bacilli were present, 13, or 9.92 per cent., died. Of 153 children with a laryngeal complication the death rate was 20.91 per cent. Simple laryngeal diphtheria gave a percentage death rate of 22, while so-called malignant or hypertoxic diphtheria was responsible for the death of 60 per cent. of those who suffered from it. Of these malignant cases those in which there was an association of organisms proved most fatal. The total death rate of all cases came to 13.10 per cent.

DIPHTHERIA AS A DISEASE OF PERSON.

Heaven (*Public Health,* June, 1903) has an interesting article on "Diphtheria as a Disease of Person." In his opinion, after the experience of an outbreak at Bristol, diphtheria is a personal disease, personally spread; and to deal with it effectually measures should be adopted to check the personal carriage of infection; other conditions, such as filth nuisances of any kind, receiving due attention as predisposing causes. In examination of cases or of contacts, the nose as well as the throat must receive attention. In the outbreaks with which he had to deal the nose played a prominent part, and it is interesting to note, after what has been said above, that the nasal bacilli were found virulent by Klein. The best methods appear to be removal to hospital of all bacteriological cases, proper disinfection, bacteriological examination of cases and contacts, and treatment of "suspicious" persons. By these last are to be understood those cases in which suspicious bacilli only were found. They can be successfully dealt with either at home or in special buildings. Success depends on carrying out the methods adopted uniformly over the whole district affected, and steadily continuing them till the outbreak has ceased. It is not necessary to close the schools, as it is easier by means of them to keep the children under supervision. Heaven very justly submits that it is hard to see how prophylactic injections can favorably affect persons carrying about infective bacilli in their nose, as regards the probability of their infecting others. He argues that the Hofmann bacillus should be taken seriously, and that "suspicious" contacts should be kept under observation. One child who only had the Hofmann bacillus died in a few days. Moreover, other cases in which this bacillus only was found, had mild cardiac symptoms when under observation, just as if they had suffered from a slight attack of true diphtheria.

CAUSES OF DEATH.

Barbier (*Annales de Médecine et Chirurgie Infantiles,* September, 1902) studies some of the "Causes of Death in Diphtheria." The two causes especially considered are cardiac thrombosis and tuberculosis. He is inclined to believe that the former is not sufficiently acknowledged as a most frequent cause of death. In his opinion toxic myocarditis and paralytic conditions are frequently blamed for disasters which would, if a necropsy was made, be found due in reality to a thrombosis. He has looked for clots in all his autopsies, and during the year 1901 found that out of 45 examinations of fatal cases of diphtheria ante-mortem thrombi were present in no less than 23. In the following year thrombosis was noted in 14 out of 26 necropsies. This gives a total of no less than 52 per cent. The clots were most frequently found in the right cavities, either in the auricle, in the ventricle, or in both. In 7 cases only were they noted on the left side. The right auricle appeared to be the most usual site. The clots in all cases were fibrinous, of a yellowish-white color, and more or less stratified. They were hard, resistant, and elastic, and firmly adherent to the walls of the heart. They were manifestly formed, then, during life; they were in no sense of the word the result of the death-agony. The patients, as a rule, died suddenly after presenting certain symptoms which had no connection with the process of death.

In 19 cases a bacteriological examination was made of the clots. In one case the result was completely negative; in the other 18 the bacillus diphtheriæ was present alone in 3, and combined with the streptococcus in 3 more. In the remaining 12 cases, streptococci, staphylococci, or both combined, were found to be present. As to the cause of the condition, the writer does not commit himself. Whether it is to be regarded as the result of a septicemia or of a pure diphtherial intoxication must remain doubtful. But he reminds us that on the tonsils and on mucous surfaces the fundamental action of the diphtherial ferment seems to be to produce fibrin, and this fact may offer an explanation of the condition.

Cardiac thrombosis is an accident of convalescence, that is to say, of the period after the disappearance of the membrane. It is surprising to find that the fifteenth day is spoken of as being the average limit of hospital observation, though we are not so astonished to learn that cases terminate fatally afterwards of this complication in their own homes. In British hospitals even the mildest case of diphtheria is seldom discharged before four weeks have elapsed. The symptoms presented by the patient most frequently were found to be a pallor of the face and chilling of the extremities. The child remained motionless on the back, and in some cases cyanosis of the lips was noted. The pulse became thready, small, quick, and irregular. There was nothing characteristic on auscultation. After the above symptoms came the dreadful distress, often accompanied by restlessness, which frequently preceded death. Consciousness was present to the end. The prognosis of such cases was, of course, most serious, and the effects of treatment *nil.*

It is certainly not a little surprising that so many of these dreadful cases of heart failure should be found to be in connection with ante-mortem thrombosis. Most of us will agree with Barbier that many such cases are attributed to myocarditis or bulbar paralysis. The paper would have been more valuable if the condition of the heart-muscle had been noted in each case, and, further, if the presence or absence of paralysis in any situation during life had been remarked. Are we to regard this thrombosis as a primary condition? Or could not the changes in the muscle and innervation of a failing heart predispose to such clots, even if they depend on bacilli and their products? The question is, of course, academic to a large extent, for the patient dies in any case in the vast majority of instances.

TUBERCULOSIS IN DIPHTHERIA.

On the question of tuberculosis in diphtheria, Barbier gives some interesting facts. In forty-five necropsies, tubercular lesions, either of old standing or of recent date, were found, in eighteen cases, no less than 40 per cent. In twelve of the cases recent lesions were found, although some of these presented also old deposits. This suggests two questions: Firstly, what is the action of diphtheria on the evolution of tuberculosis? The fact that 25 per cent. of fatal diphtheria cases have presented recent lesions which must have developed concomitantly with the diphtheria, and that no less than 53 per cent. of the cases in which tuberculosis was latent on admission showed fresh lesions on the post-mortem table, would go to prove that diphtheria lights up tuberculosis. The second question is, what influence has tuberculosis on the course of diphtheria? Barbier has a strong impression that the diphtheria is aggravated, and that cardiac symptoms, apart from those of thrombosis, are more frequent and severe.

UNILATERAL PARALYSIS OF THE PALATE.

Aubertin and Babonneix (*Gazette des Hôpitaux,* November 20, 1902) report three cases of unilateral paralysis of the palate consecutive to involvement of one side of the throat only. In two of the cases the false membrane was limited, or nearly so, to the right side of the fauces and in both extended over the right side of the palate. The paralysis came on early—in the second case before the throat was clean. The palate was immobile, or nearly so, on the right side, and the uvula was drawn to the left. In pronouncing the vowels A, E, I, and in making a movement of deglutition these symptoms were accentuated.

In the second case it was noticed that, on swallowing, fluid regurgitated through the right nostril only. The vocal cords were unaffected. Later on, when the unilateral paralysis was less marked, though still limited strictly to the one side, paralysis of accommodation affected both eyes equally. The third case is not so clear, as the membrane, involving the whole left side of the fauces, was also present on the right tonsil. A paralysis appeared a month later, most marked on the left side, though the right side was also slightly affected. The uvula, on attempted movement, deviated strongly to the right.

Additional interest is given to this paper by three cases extracted from those observed by Colin and Acker, which are added in full to those seen by the writers. The conclusion is that paralysis is found most frequently on that side of the throat which has been most affected by the membrane. Cases, however, have been reported where a patient, whose throat was affected equally on both sides, suffered from a unilateral paralysis only. If all cases of palatal paralysis were examined carefully, it would probably be noted that many of them are merely unilateral. It is only exceptionally that, as in the second case reported, attention is drawn to a particular side by fluid returning exclusively through one nostril. Otherwise a unilateral paralysis gives precisely the same external signs as a double one. When a unilateral paralysis exists, it very seldom spreads to the other side of the palate. A generalized paralysis, affecting other parts of the body, may follow it without the healthy side of the palate becoming paralyzed. Sometimes when a generalized paralysis exists, it may predominate on the side on which the palate is affected, as in a case of Acker's quoted by the writers. All this goes to prove that there is a very intimate connection between the site of the original inoculation and the resulting paralysis.

INTRAVENOUS INJECTION OF ANTITOXIN.

Perhaps the most original and useful contribution to the year's literature on diphtheria is the article by Dr. Louis Cairns (*Lancet,* Dec. 20th, 1902) on Intravenous Injection of Antitoxin. He had previously suggested this method of treatment in plague with Yersin's serum, and it struck him that the good results so obtained would also ensue in diphtheria, when the analogy of the pathology of the two diseases is considered. He therefore tried the treatment of diphtheria by this method at the Belvidere Hospital in Glasgow, and had every reason to be satisfied with the results, which anyone who reads his cases impartially will admit are absolutely brilliant. In the first place he argues in favor of large doses of antitoxin, such doses never doing any harm to the patient; while it is only reasonable to suppose that the more serum injected the more toxin is neutralized. But even with these large doses, for instance, 20,000 or 30,000 units, a certain number of severe cases show no improvement at all, if the antitoxin is only given subcutaneously. This he attributes either to a selective influence on the part of the glands in filtering out the active constituents of the antitoxin, or to the fact that there are a definite chemical action and reaction between toxin and antitoxin, neutralization going on more quickly in concentrated solutions than in diluted ones. We may add that it would also seem probable that the antitoxin, when obliged to pass through the glands, must depend very largely on the strength of the circulation which is notoriously enfeebled in severe cases of diphtheria, and that it probably comes through so slowly as to be in a very high dilution in the blood and tissues. Cairns points out that the tendency of the bacilli is to spread all over the system. It is now recognized that most cases of broncho-pneumonia, complicating laryngeal diphtheria, depend primarily on the Klebs-Löffler bacillus. Moreover, everything in the anatomical construction of the lung seems to favor the rapid absorption of toxin. The amount of toxin absorbed in such cases must be very great, and it needs correspondingly large doses of antitoxin to counteract it. Broncho-pneumonia is admitted to be the most frequent cause of death after a tracheotomy.

It was in such a case that an intravenous injection was first tried, with most encouraging results. The patient, a little girl of two years of age, was admitted pulseless, with cyanosed lips, livid, and cold at the extremities. On auscultation the heart was found to be beating 185 times per minute. The respiration was very difficult, shallow, and no less than 60, a rate certainly suggesting a pneumonic lesion. The laryngeal obstruction was almost complete. Tracheotomy was at once performed, but, though the distress in breathing became less, the lividity of the patient was unaffected. Broncho-pneumonia having been diagnosed, 6,000 units of antitoxin were injected into the right median basilic vein. For two days the patient continued to be desperately ill, though the pulse was readily counted. The urine, on boiling, was solid with albumen. On the third day after injection, a marvellous and steady improvement was first noted. The lividity decreased concurrently with a free expectoration of mucus through the tube. The temperature fell steadily, and the pulse and respiration with it. The tube was removed on the eighth day. Convalescence was uninterrupted. Details of three other equally remarkable laryngeal cases, complicated by broncho-pneumonia and trachetomized, are given. In another case, in spite of an injection subcutaneously of 18,000 units on admission, broncho-pneumonia developed three days later. The breathing became worse, tracheotomy was performed, and 22,000 units injected intravenously. There was immediate improvement, and the case recovered.

In malignant cases, with collars of glands round the neck and with especially filthy throats, the new treatment was found to be equally successful. Taking the results altogether, Cairns claims, first, that the signs of marked toxemia rapidly disappear; secondly, that the glands subside very quickly; and thirdly, that the restlessness, so marked in broncho-pneumonic cases, ceases almost immediately after injection. In all, fifty consecutive cases are dealt with in the figures given. Of these, twenty were considered severe enough to make it worth while trying an intravenous injection. The cases were at least of average severity. The death rate was 6 per cent. only, an astonishingly good figure. Thirty-one of the fifty cases were laryngeal and seven nasal. Fifteen were complicated with broncho-pneumonia, and in seventeen it was found necessary to perform tracheotomy. The death rate of this operation was only 5.8 per cent.

The indications given by Cairns for this method of injection are malignancy of the disease, involvement of the lungs, a moribund condition on admission, and lastly, marked toxic symptoms. The technique of the operation is not given. The initial doses vary from 20,000 to 30,000 units. Every one interested in diphtheria will admit that there are many apparently hopeless cases in which such a treatment might be of value. We all know a class of case which our experience leads us to regard as hopeless from the start. In these cases the intravenous injection should, I think, always be attempted. I have, at the Edinburgh City Hospital, latterly made a practice of using it in desperate cases. In some improvement has been very marked. It is unfortunate that Dr. Cairns did not have a real hemorrhagic case with purpuric spots on the skin in his series. These are the most invariably fatal of all diphtherias. I may say that one of this type to whom I gave an intravenous injection lived longer than any case of the kind I have yet seen, and there is absolutely no doubt it benefited greatly by the treatment. Had it come under treatment a day earlier I believe it would have been saved. My experience, then, of intravenous injection leads me to rcommend it cordially, and I look forward with interest to Dr. Cairns' next series of cases, which it is to be hoped he will also publish.

LAVAGE OF THE BLOOD IN DIPHTHERITIC PARALYSIS.

Schoull (*La Presse Médicale,* June 13, 1903) has a communication on Lavage of the Blood in Diphtheritic Paralysis. The patient was a man of 31 years, who on the fifth day of an attack of diphtheria had paralysis of the palate. A month later, when admitted to hospital, there was also paralysis of the esophagus, complete paraplegia, paresis of the upper extremities, ptosis, and cardiac pain. A few days later the condition was even more aggravated, and the bladder and rectum became paralyzed. The respiration also became difficult. Injections of strychnine, caffeine, and ether were tried without result. Inhalations of oxygen also failed to relieve the patient, who appeared hopeless. Schoull then applied a large number of leeches in the neighborhood of the anus, and injected a litre of Hayem's serum to "wash the blood" as it were. This gave a marvellous result. The patient, in a dying condition in the morning, appeared out of danger in the evening. Next day the improvement was still marked. A month later the patient left hospital completely cured. Schouell thinks this treatment might be tried with advantage in cases of much less severity.

INTUBATION.

McCollum (*Archives of Pediatrics,* October, 1902) has much to say in favor of intubation of the larynx. It is curious that, although, as we shall point out shortly, this method is becoming more frequent in Great Britain, as a nation we should remain practically alone in preferring tracheotomy. McCollum prefers the O'Dwyer tube to the Bayeux pattern, thinking that the only advantage of the latter is its ready enucleation without an extractor. On the other hand, his experience is that it is more readily coughed up, which I may here note is not the case in my experience; and I am accustomed to use both types of tube indifferently. Indeed, if anything, I had an idea that the O'Dwyer pattern was coughed up more frequently. McCollum found that with the nasal method of feeding intubated patients, he had too many cases of resulting middle-ear disease. He has, therefore, discontinued it in favor of a soft rubber esophageal tube. It may here be noted that, in the discussion which followed Dr. McCollum's paper, Dr. Jennings thought that artificial feeding need seldom be resorted to, and that a child will suck very well with its head over a table, or with the foot of the bed raised (Casselberry's position). Fairbank (*Lancet,* June 20, 1903), in a paper to be alluded to later, prefers feeding by the mouth slowly and carefully with a spoon, and thickening the milk with arrowroot if there is too much coughing. He thinks that Casselberry's position is unnecessary, and seldom uses nasal feeding except occasionally after the tube is removed, when there is not infrequently a temporary difficulty in swallowing. I myself am accustomed to feed such cases partly by the rectum and partly by the mouth, according to their ability to swallow. Semi-solids are often taken best.

McCollum believes, contrary to most writers on the subject, that adults can be intubated with advantage. He has had six or eight adult patients so treated, and he is convinced that stenosis can be more easily relieved by intubation than by tracheotomy. One of his patients was a man of sixty, in whom tracheotomy would probably have been difficult. His experience of intubation goes up to the remarkable number of 1,200 cases, with a death rate, including all causes of death, of 40 per cent. If, however, the cases which, locally relieved, died subsequently of paralysis, and the cases dying within twelve hours of admission are deducted, his percentage death-rate is only twenty-five, a very satisfactory figure. He compares it favorably with the tracheotomy death-rate of the London and Glasgow hospitals, which is about 35 per cent. This is hardly fair, as it is, I think, not quite the case, as he asserts, that cases admitted apparently moribund, are not operated on in these hospitals. On the contrary, the tendency is always to operate, and no doubt if the death-rate of these hospitals were corrected by deducting the moribund and paralytic cases, the British statistics would be practically the same as his own. Personally I have always believed that it is far safer to judge a hospital by its laryngeal death-rate rather than by its operative death-rate. Some operate on a class of cases which others leave alone with equal success. One of the points in favor of intubation, to my mind, is that one can postpone it longer than one can a tracheotomy, and, after the use of antitoxin, it is always worth while giving it a chance before interfering. McCollum, while admitting that tracheotomy is obviously to be preferred in country districts, where, if a tube is clogged or coughed up, a doctor is not readily found, believes that in town practice, as well as in hospitals, intubation is much superior to tracheotomy. Its advantages are that there is very little shock, that parents consent much more readily to the operation, and that the chances of a subsequent broncho-pneumonia are much less. Retained tubes are not frequently noted; in fact, he has only seen one case, and in that the tracheotomy-tube, which was subsequently found necessary, is also still retained. I may say that in my own experience, very much less extensive than that of McCollum, I have only met with one such case, and in that also the tracheotomy tube cannot be dispensed with. McCollom usually leaves a tube in three or four days. Occasionally only has it to be replaced.

Josias and Tollemer, in the paper (*Archives de Médecine et Chirurgie Infantiles,* November 1, 1902) already quoted, prefer the Froin pattern of tube, which, so far as I am aware, has not found its way to this country. They give the useful warning that these tubes are somewhat large for the ages marked on them, and that it is safer to use a smaller size. These tubes appear to approximate more to the O'Dwyer than to the Bayeux type. They have a special arrangement for extraction with the finger, but most people who use them seem to prefer to use an ordinary extractor. It is interesting to find that, in cases where it is difficult to get the patient to dispense with the tube, Josias and Tollemer have found it most advantageous to alternate the Froin tube with that of Bayeux. I am accustomed to do the same thing in such cases, using an O'Dwyer and Bayeux tube alternately. The points of pressure are probably different enough in the two patterns to give rest, as it were, to any part of the mucous membrane which may be threatening to ulcerate, and it is usually ulceration which prevents us from finally getting the tube out.

It is satisfactory to find that the Great Ormond Street Children's Hospital has taken to intubation. Fairbank (*loc. cit.*) reports a series of 33 cases. His percentage mortality was 27, a figure which includes cases admitted practically moribund. He emphasizes the danger of opening the mouth too widely with the gag, and he prefers the recumbent position, surely the right one in a disease like diphtheria, in which it is so necessary to keep the patient flat. Unlike most writers he leaves the string in position. In this I also cordially support his views, as I have never found the retention of the string any inconvenience, if the child's arms are in pasteboard splints, a method which I notice he also favors; and on the other hand the string enables a nurse to pull out a blocked tube at once. The string is fastened to the cheek by strapping. In one of Fairbank's cases the string was bitten through. This may be, in my experience, avoided by the use of a banjo-string, which is guarded with fine wire and is much more difficult to bite through. We have already noticed Fairbank's views on the method of feeding.

Although, I think, there is some doubt whether tracheotomy is not more suitable in private practice, there is every reason to believe intubation is the best operation in hospital. In America, even in private practice, the cutting operation has been practically displaced. As McCollum says in his paper, it is remarkable that in the French hospital named after Trousseau, the greatest opponent of intubation, all laryngeal cases are now treated by this method. In fact the operation seems to be in France, as in America, the operation of election. Much the same is the case in Germany. The time has come when a much more extended trial should be given it in this country.

AN EASY METHOD OF PERCENTAGE INFANT FEEDING[1]

By C. W. M. Brown, M. D., of Elmira, N. Y.

If it be true as has been claimed that 50 per cent. of American infants are fed by artificial methods, then there is urgent need that every general practitioner as well as pediatrists should be familiar with infant dietetics and the adaptation of suitable mixtures to the individual case. The history of the general consensus as to the best methods of artificial feeding of infants, reflects more rapid changes during the last few years than any other branch of medical practice. These changes have been brought about by a better understanding of the composition of human milk and a better knowledge of the bacteriology of milk and of the intestinal canal, as well as by a more thorough appreciation of the principles of feeding and nutrition. Biedert, thirty years ago, first gave an impetus to scientific milk examination and modification based upon chemical examination and made recommendation of mixtures of cream and milk, sweetened and made alkaline with lime water.

Ten years later, in 1882, the younger Meigs called attention to the low percentage of the proteids in human milk as well as the necessity for reducing the proteids in mixtures for artificial from cow's milk, and first worked out a formula that he believed corresponded with the analysis of human milk.

In 1886, Soxhlet proposed sterilization of cow's milk by heating as the best safeguard against the intestinal diarrheas of bottle-fed infants. This had been practised for many years previously by Jacobi in our own country. For a time sterilization became general all over the civilized world. Later, in 1890, Rotch made original contributions to percentage milk modification including the use of laboratory methods and prescription feeding. From this point all the recent advances have proceeded. The very fact that the laboratory methods were not available for general use made it necessary that others should devise ways and means by which we might approximate the advances suggested by Rotch. That so many methods and statements have been put forward concerning milk modifications suggested the lack of practicability inherent in most of them.

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[1] Read before the Elmira Academy of Medicine, June, 1903.

Methods of calculation or modifications have been proposed by Holt, Baner, Coit, Wescott, Taylor and Bartley and others, whereby various combinations more or less accurate of the percentage of fat, proteids, and sugar, could be determined in a mixture. These systems of modification were supposed to be made available for the so-called home modification of milk in the absence of the milk laboratory; also for the guidance of those requiring accurate milk adjustment for the private case or for the large number of delicate infants in hospitals and other institutions. That the physician should be able to think in percentages to construct his own formulæ, reduce them to simple terms and transfer the modification of the mixtures to the caretaker, is absolutely necessary if he would do good work among the larger number of his feeding cases. The necessity, therefore, upon us for more general and careful study of infant feeding is becoming more and more urgent. We are altogether too prone to get ready-made foods and to fall back upon that strong hold of ignorance, that there are many children who "cannot take milk." The secret of successful feeding is to give a food which a child can digest. Age and weight are no guide in many cases. The key to success lies in putting the strength of the mixture down to so weak a point that a child can digest it, and then work it up to the point of tolerance.

The digestive organs of a young infant are exceedingly sensitive, easily deranged, and the simple functional derangement speedily becomes a gastric or intestinal catarrh. Hence the importance of paying attention to the food for the first month or two and of promptly and intelligently making necessary changes in the food to relieve the minor symptoms of indigestion. Feeble digestion or chronic indigestion are seldom due to inherited conditions, but in most cases are the result of previous bad feeding or bad nursing. The carefully obtained history is of great value in enabling one to judge of the condition and capabilities of the digestive organs of an individual child. A careful regulation of the milk percentages in intelligent hands will, in private practice, be successful in a great majority of cases. Success by this method may be extended in proportion to the accuracy of the diagnosis of the case, of the symptoms, and to the degree of error in the previous prescriptions employed. Cases that cannot be helped in this way are chiefly very young infants, and those in which the disorder is of long standing.

One of the secrets of the success obtained by many specialists in feeding children of weak digestion, lies in the fact that they boldly put the mixture down to very small percentages in spite of the fears of the mother that the child will not get sufficient food. That is the secret of the digestion of condensed milk. In a 1 to 12 dilution we have a food that contains but 1-8 of the amount of fat and 1-3 of the amount of proteid found in the normal breast milk. The fact that children do not do worse on these exceedingly weak milk mixtures is but one of many proofs that they commonly receive more than they require. If the doctor who is wedded to the use of condensed milk would not make his fresh milk mixtures four or five times as strong as his condensed milk mixtures, he would be much better satisfied with fresh milk.

The central thought in the newer modification which Holt aptly calls the "American method," is to consider the different elements of the food separately and to adapt their proportions to the child's digestion. It is based upon the percentage composition of woman's milk, and also recognizes that there is a difference in the digestibility of cow's milk and woman's milk, particularly in the proteids. It aims to discover the proper proportions of fat, sugar and proteids and the best methods of increase in healthy infants. When difficulty exists in the digestion of milk it is usually with one of its constituents rather than with the milk as a whole, or at least, chiefly with one. In such a condition instead of stopping milk entirely, or reducing the proportions of all the constituents by further dilution, the proportions of that one which is causing the disturbance should be changed; in other words, percentage modification aims at something which is "definite, exact and at the same time flexible." It is perhaps a futile dream to hope that some day as a result of artificial selection and feeding, it will be possible to produce a cow that will yield milk that closely resembles in composition woman's milk. But as this has not yet been done, it is necessary to modify it, to use the technical phrase, in order to make it resemble woman's milk.

How, then, can modification be effected? It can be done in a milk laboratory or at home. The first involves considerable expense and may be impossible in the absence of a laboratory. The second or home modification although so simple in principle is, owing to the complexity with which it is already laid down in text-books and in journal articles, often dreaded by the physician. Physicians revolt at doing an algebraic problem and considering an arithmetical sum at the bedside, and they also object to explain what they have been led to believe is a difficult and complicated process. On this account they either depend on the milk laboratory or solve the problem of infant feeding by telling the mother to get such and such a patent food and follow the directions. Many of these babies fed on patent foods go from bad to worse, although many thrive as they are in reality fed on crudely modified cow's milk with the addition of a food more or less useful, as the case may be.

The knowledge of home modification of milk would obviate this. This knowledge is necessary even when the conveniences of the laboratory can be obtained and where expense is not an object. For it is, I am sure, a fact that even with intelligent changing of the formulæ, laboratory modifications do not always agree. Infants are not machines and they are not all alike, and they will not always do what you expect of them. Laboratory milk is first divided into two parts by a centrifugal process—one containing practically all the fat and the other part nearly free from it. These two portions are then recombined with water, sugar of milk, and lime water in proportions to meet the formulæ required. In milk modifying at home the cream is obtained by natural separation, by standing.

In the *Boston Medical and Surgical Journal,* of March 25, 1899, Dr. Charles W. Townsend describes a method of milk modification which I have used for some years with satisfaction, and which seems to me to be the simplest of all, therefore I shall quote freely from his writings. He and others found by numerous tests that the upper fourth of milk of average quality after standing four or five hours contained approximately 10 per cent. fat, 4 per cent. proteids, and 4 per cent. sugar. The percentage of albuminoids in this top milk is practically the same as in whole milk, that is 4 per cent. It will be seen that the relation between the fat and albuminoids is the same as in human milk, the fat being 2½ times as great, that is, 10 to 4, or 4 to 1.60 per cent. Top milk can be obtained by siphoning off the lower three-quarters, or more simply by pouring off the upper quarter. And it has been found that the cream obtained by these two methods is practically the same, varying according to Dr. Townsend's experiments only .17 of 1 per cent. The result being the same, the decanting process is preferable, it is much simpler and there is less difficulty in doing or having it done accurately, and there is no siphon to be procured and kept clean. With a 10 per cent. cream it is evident that one ounce of cream in a 20 ounce mixture would give a percentage of 1-20 of 10 per cent. or one-half of 1 per cent. of fat. In the same way the percentage of albuminoids would be 1-20 of 4 per cent. or .2 of 1 per cent. The percentage of sugar would be .2 of 1 per cent.

One more fact is needed before formulating a rule for human modification and that is that an even tablespoonful of sugar of milk weighs 3½ drams and each tablespoonful added to a 20 ounce mixture raises the percentage of sugar 2 per cent. It may be added that each tablespoonful of cane sugar which may sometimes be used, raises it 3 per cent. The rule to be remembered is this: Each ounce of 10 per cent. cream in a 20 ounce mixture represents .50 of 1 per cent. of fat, .20 of albuminoids and .20 of sugar; and each even tablespoonful of sugar of milk represents 2 per cent., or of cane sugar 3 per cent. Thus, if we order top milk, 4 oz.; water, 15 oz.; lime water, 1 oz.; sugar of milk 2 tablespoonfuls, we are making a formula of fat 2 per cent., sugar 4.8 per cent. and albumin .8 per cent. If we order 8 oz. of top milk, 11 oz. of water, 1 of lime water and 2½ tablespoonfuls of milk we are making a formula of fat 4, sugar 6.60 and so on. Of course, this extremely simple method gives, as I have said, a fixed relation between the fat and albumin, the fat being 2½ times as much as the albumin, the normal relation in human milk. If we wish to increase the albumin without the increase of fat it is necessary to add milk from which the cream has been removed, or whole milk, or top milk, containing less than 10 per cent. of fat.

By ordering whole milk which contains 4 per cent. of fat, 4 per cent. of proteids and 4 per cent. of sugar; the upper quarter which contains 10 per cent. of fat, 4 per cent. of proteids and 4 per cent. of sugar; the upper half of which contains 7 to 8 per cent. of fat, which for the purpose of calculation, may be called 8 per cent., 4 per cent. of proteids and 4 per cent. of sugar, or gravity cream which contains approximately 16 per cent. of fat, 4 per cent. of proteids, and 4 per cent. of sugar, and pursuing the same methods of division we can obtain almost any proportions of fat or proteids. The sugar can be raised to any desired amount by remembering the rule already given—namely, each level tablespoonful of sugar of milk added to a 20 oz. mixture raises the amount of sugar by 2 per cent., the amount of sugar in a mixture being the same as the amount of albuminoids. In digestive disturbances where the fat, sugar and albuminoids all have to be reduced to minute quantities, the nutritive value of the mixture can be greatly increased without materially taxing the digestion by the addition of the raw white of egg. The white of an egg in a 20 oz. mixture adds half of 1 per cent. of albumin. One ounce of top milk, 18 oz. of water, 1 oz. of limewater and 1½ tablespoonfuls of sugar of milk give the formula: fat, .50 of 1 per cent.; sugar, 3.20 per cent.; albuminoids, .20 per cent., can be made much more nourishing by the addition of the whites of one or two eggs, and will be retained where the increase of the milk would not be. The proteids give most trouble in infantile digestion, therefore, their modification is most important.

Woman's milk contains twice as much lactalbumin, which is noncoagulable (0.9 to 0.5 per cent., Bartley) as casein, while cow's milk contains 2 or 3 times as much casein as lactalbumin (3. to 0.75, Bartley). Because of this, cow's milk coagulates as a fine, dense mass in the infant's stomach, which is only lessened, but does not disappear, when the proteids are reduced to the same amount as in woman's milk. This necessitates making the proteids at beginning, feeding as low as 0.30 to 0.50 per cent. If this is done and the fat made as low as 1. to 1.50 per cent., the food strength may be gradually increased with slight risk that the milk will fail to agree, but if milk, especially the proteids, has been given too strong and continued until the child has a gastric or intestinal catarrh or both, then much time will be lost before food of proper strength and amount can be safely given.

Many other mixtures can be used in difficult cases, such as the use of whole or part whey mixtures, in which the casein has been coagulated with pepsin and strained out, with the addition of white of eggs and the use of cereal decoctions made from oatmeal, barley or rice. It is probably true that most children will do better after the seventh or eighth month with the use of a cereal decoction as a diluent for the milk, and in some cases they are undoubtedly of advantage in much younger infants.

Holt summarizes the most important indications for varying the percentages as follows: If not gaining in weight and with no special signs of indigestion, increase proportions of all ingredients; if habitual colic, diminish the proteids; for frequent vomiting soon after feeding, reduce the quantity; for the regurgitation of sour masses of food, reduce the fat and sometimes the sugar; for obstinate constipation, increase both fat and proteids.

The criticism may be made that this system or method lacks accuracy. That it has the accuracy of the laboratory methods is not claimed, but all breast milk is not the same. All children would not thrive on the same breast. The most recent analysis shows that it is subject to rather wide variations in composition even when the nursling thrives in a normal way. This proves that the average infant can tolerate rather wide variations in its food without trouble and that extreme accuracy in the proportions of the constituents is not essential.

CONCLUSIONS.

1. The modification of cow's milk for infant feeding may safely be done at home under the care of the mother, or nurse of ordinary intelligence, and is preferable to guess work.

2. It is based upon the known composition of mother's milk, and also upon the known dissimilarities between it and cow's milk, especially in the proteids.

3. The method of home modification and of calculating the percentages should and can be made extremely simple, and such modifications can be made sufficiently accurate and uniform.

4. The addition of cereals to the milk in the form of barley or oatmeal water is generally desirable after the seventh month, and is desirable before that age in some cases as an aid to the digestibility of the milk.

311 Baldwin Street.

CONCLUSIONS FROM FIFTY-ONE INTUBATED FATAL CASES OF LARYNGEAL DIPHTHERIA.[1]

By B. R. Shurly, M.D., Detroit, Mich.

A study of medical literature and a glance at a medical society program reveal the fact that the majority of subjects presented are reported entirely to emphasize successful results. From this standpoint an author usually advocates most forcibly some particular line of treatment that has been followed without fatal complications. The unsuccessful cases and the mortality side of medicine and surgery are given such meagre consideration in the profession, that during these many years of scientific work in our local colleges and hospitals little attention has been given practically in our own city to gross pathology. We have no morgue, no post-mortem amphitheater, and no classified scientific reports from our county physicians, who conduct most of the autopsies performed here. In fact, scientific work in this field must be limited until adequate facilities are supplied. Only two post-mortems were obtained in this series of cases, and these were performed under such conditions in private houses that the most enthusiastic searcher after pathological truths would turn from his work and wait for other opportunities. It is with a full realization of these scientific deficiencies that I report this series of fatal cases, but with a belief that the study of why our patient dies is sometimes of much greater value than why he lives. Four years ago the writer reported a series of 200 intubations with fifty-one deaths, and according to the usual custom the most brilliant recoveries were selected as special cases for report. While today these cases stand on record as good results in this line of work, these fatal cases are a summary of experience of untold value to the practitioner. Each fatal result teaches its lesson and proves a scientific contribution to the physician who battles against disease.

Given a disease with a definite constant micro-organism as its cause—the Klebs-Loeffler bacillus—and an absolutely certain specific remedy when administered in the proper dosage at the proper time; why were there fatal cases of this disease to the number of 526 in the State of Michigan in the year 1900 and why has the city of Detroit a mortality of over 20 to 25 per cent.? This problem can be solved with the exactness of mathematics. For demonstration purposes, allow me to submit the first series of thirty-one fatal intubations occurring in 100 cases. Of these, thirteen were *in extremis* at the time of operation. The causes of death are divided as follows: Bronch-penumonia, 5; Broncho-pneumonia and sepsis, 6; Broncho-pneumonia, extension of membrane and sepsis, 15; Broncho-pneumonia, extension of membrane and nephritis, 2; Heart paralysis, 3. (One of these occurred two weeks after the removal of the tube.) The mortality under three years was 49 per cent., while over three years, it was 19.6 per cent. Eight of these fatal cases showed a diphtheritic laryngitis engrafted on a laryngitis of measles, with five deaths. Thirteen fatal out of thirty-eight city cases operated gave a mortality of 34 per cent. By way of comparison let us examine the second series of 100 operations with twenty deaths. Here the mortality under three years fell to 29.2 per cent., while over three years it was only 12.1 per cent., and among city cases the mortality in thirty-one operations was five or 16.1 per cent. Intubation in acute diphtheric stenosis is absolutely unnecessary and preventable. Why were these cases intubated? A careful consideration and study of the reasons and factors operating in the fatal termination of these fifty-one cases have proved exceedingly valuable in subsequent operations. Intubation, we must remember, in the hands of the conscientious surgeon, is performed only when other methods have failed. The fatal cases were frequently seen *in extremis.* In the first series no antitoxin was given in ninety cases until the operation was performed, while in the second series seventy-two cases progressed to operative interference without the serum. It is not sufficiently realized that the question of a few hours in the use of our specific remedy may turn the tide against us. Each fatal case of laryngeal diphtheria demonstrates with mathematic exactness that the patient died of extension of the membrane or sepsis and the sequelæ. Both of these conditions are absolutely preventable by administering a curative dose of serum on the first day of the disease. Fatal broncho-pneumonia, adenitis, nephritis and cardiac paralysis are attending phenomena of sepsis and are usually unnecessary if the case is treated without delay. In this series of fifty-one fatalities no two deaths occurred in one family, although many severe cases in the same house were frequently under treatment after the first visit. Prophylactic dosage in my experience has been uniformly successful, but it has not received the extensive use its wonderful efficiency deserves. Many of my cases were lost from insufficient doses. In a personal conversation with Prof. Adolph Baginski, of Berlin, one of the pioneers in the use of Behring's serum, he informed me that malignant and laryngeal cases are given an initial dose of 1,000 units and the serum has practically eradicated diphtheria from Berlin. Our cases show that at least 2,600 units are required for every laryngeal case, and this should be repeated in six to twelve hours until a favorable reaction is obtained. The necessity for a reliable preparation is so apparent that the manufacture of this product should be under government control; and until such time it is of great importance to use only a thoroughly tested serum.

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[1] Read before the Wayne County Medical Society, September 24, 1903.

My notes fail to record the number of cases suffering from enlarged tonsils and adenoids, but the observations are exceedingly numerous. Second only in importance to the delay of physicians and parents in providing an early dose of antitoxin in diphtheria should be placed the condition of lymphatism. There can be no more forcible argument offered for the surgical removal of these hypertrophied tonsillar and adenoid glands than the greatly increased number of complications and consequent mortality resulting from them. The true significance of these factors in a fatal issue of the disease is too frequently overlooked. The hyperemic tissue and engorged lymphatics furnish a rapid filter for the virulent toxins and the fatal processes are extremely rapid in this class of patients. In these cases especially a very large initial dose of antitoxin is indicated.

No sick child of any age has received intelligent professional care unless the throat has been examined at the first visit. This precaution would save many lives, especially among children from one to three years of age. The mothers should be instructed to train their children in this regard and to look with suspicion upon an exudate of any variety. The Board of Health has not enforced the rigid quarantine this disease requires. This disease in Michigan had 529 fatalities reported in 1900, while small-pox, that terrible scourge that demands the immediate services of the health officer, the removal of our patient to the pest house and vaccination of all exposed, with the usual attending family panic, claimed nine deaths in Michigan during the same year. The same expenditure of zeal, quarantine, and the prophylactic use of antitoxin would reduce the mortality of diphtheria at least one-half. When a case of diphtheria is reported (and some are not reported), it should be the duty of the city to provide immunization for all those exposed, and especially children under five years of age. In most of these fatal cases reported the source of infection could be traced. Three cases were intubated in different families who successively occupied the same house; eight cases, four of which were fatal, came under my observation in an infected Garfield Avenue house, occupied by four Polish families. The cases were of the laryngeal variety, illustrating the peculiar contagiousness of the disease in this special type. Negligence and lack of care among the ignorant classes of our city must continue to operate as important factors in a fatal result and these conditions are necessarily beyond our professional control. The opposition to the use of antitoxin and the tube has given way before the successful results, and it is rare indeed at the present time to meet antagonism. It would be unfair to discuss this subject without due reference to the accidental deaths that resulted directly from the treatment. Antitoxin *per se* can not be held responsible for a single death in this series; insufficient dosage, however, will explain the great majority of them. To the accidents of operation I would assign three deaths which occurred early in my experience. One of these resulted from the breaking of an obturator. The child had been doing well for some hours, when the tube was coughed out. In an attempt to replace it some hours later the only obturator I possessed with the usual small set of tubes broke at the hinge-joint, and I was unable to introduce the tube with the extractor. Before another was obtained the child died. This sad experience taught me the necessity for a large supply of tubes, and a special case carrying twenty-eight tubes (four sets) was ordered. Two cases died suddenly from membrane plugging the tube and those in attendance were unable to remove it. These deaths were influenced also by lack of experience and poor judgment. Where the membrane is below the tube and this possible danger is apparent, the string should be left attached to the tube for some hours. One fatal result occurred from the negligence of the nurse, who slept through the night. When she awoke the child had been dead some hours. It had coughed out the tube and a fatal asphyxia developed. The question of secondary tracheotomy is always to be considered and in selected cases the recoveries are less than 5 per cent. In private practice it is usually impossible to save the little patient by this method, and most authorities discourage the procedure. Successive intubations will ordinarily accomplish all that is possible. Secondary tracheotomy is indicated, however, in cases that show persistent extension of the membrane without a severe degree of sepsis. The location of the membrane is of the greatest importance in considering the prognosis. Of these operated cases, 158 showed membrane engrafted on other regions in addition to the larynx. Naso-pharyngeal involvement demands large doses because of the increased danger of rapid absorption of toxins. The ascending type with primary infection of the larynx seems less fatal than the descending variety.

In conclusion, allow me to again emphasize the extreme importance of the early administration of large doses of antitoxin and the immunization of those exposed. A fatal error has frequently come under my observation, that of mistaking the meaning of the classification, Double x serum. Double x serum refers to twice the bulk or concentration of the product, but no increase in antitoxic value. In other words, 2,000 units single x are identical in curative value with 2,000 units double x. The majority of physicians who have used antitoxin occasionally fall into the serious and fatal error of believing one to be twice the value of the other. It would seem necessary to request the laboratories manufacturing antitoxin to make the directions and title of the product so clear that no possible confusion can arise. Under the present system the mistake is leading to fatal results. To summarize the views mentioned above and to enumerate according to importance the chief reasons why these cases were fatal, I should make the following classification: I. Delay in giving a large initial dose of antitoxin, for which there are two causes: Delay in calling a physician; delay by the physician. II. Insufficient dosage at later intervals. III. The delay in intubation. IV. The presence of hypertrophied tonsils and adenoids. V. Lack of proper nursing. It is with the belief that the details of the therapeutic action of antitoxin and the dosage required in each case are not given sufficient attention, and the hope that larger quantities of serum will be used that this subject is presented for your consideration. The fatal results from the disease must then diminish to at least a 5 per cent. mortality, and intubation will be given its proper place among the rare methods of operative interference.

32 Adams Avenue West.

EFFECTS AND TREATMENT OF ADENOIDS.

By H. M. DeJarnette, M.D., Charlottesville, Va.

Adenoids are lymphoid growths in the rhino-pharynx of children, and are known as pharyngeal tonsils. They may remain permanent, and often extend into the pharynx.

Symptoms.—The child is either stupid or extra *bright,* but as a rule has a stupid expression of face, and is dull and apathetic—semiconscious of his or her surroundings. He is fidgety and always in motion—either as to his hands, feet, body, eyes, or some set of muscles. And why? Because there is want of something and he knows not what it is. *It is oxygen* he wants. As a rule such children are considered bad in some ways because they are constantly being irritated by the CO_2 in their systems, and if this poison were eliminated properly they might be excellent children and would appreciate good health more than a child that was never sick, and would appreciate the difference. The diseased child never has rest; he has to do *something,* but of course he never thinks of *removing* the real *cause.* If you give such a child rest you will not have to bother about his happiness as it is sure to follow. But such a child never gets rest. They get up in the morning tired as if they had been doing manual labor, and they have been working all night trying to get enough oxygen and eliminate CO_2 and the poison that has been taken in from this diseased adenoid tissue.

The inspired air not being moistened and warmed, the respiratory organs suffer. As he is a mouth breather the physiological channel for air and secretions of the frontal sinuses, ethmoidal cells, sphenoidal sinus, and maxillary sinuses are all obstructed and drainage from the eyes is blocked. The secretions are drained into the nasal cavities and there become putrid, as nature's best antiseptic, "fresh air," cannot get there. Then this poison is taken back into the circulation through the mucous membrane of the diseased turbinates, and the erectility of the tissue of a diseased turbinate is very great. Then trouble begins in the connecting sinuses and cells.

The superior maxilla becomes malshaped, and when the inferior maxilla does not fit the superior it looks as if it were malshaped. The teeth of the upper jaw are as a rule crowded or overlapped, because when the child is asleep and mouth open there is scarcely any current of air through the nares. When the child breaths in 14,000 times and breathes out 14,000 times—28,000 acts of breathing each night—so many times is the current of air thrown against the roof of the mouth (which is 28,000 taps against the superior maxilla every night) that this causes overlapping of the teeth of upper jaw.

This adenoid tissue often extends into the pharynx, and there these masses often press against the opening of the Eustachian tubes. When they are closed the air in the middle ear is absorbed and the drum membrane is pressed in by external atmospheric pressure. If left in this condition the bones of the ear become anchylosed. The membrane over the foramen rotundum loses its elasticity and becomes thickened, and if that be the case we have impairment of hearing, as the foot plate of the stapes cannot be pressed into the fenestra ovale unless there is some part of the wall that is elastic, and the membrane over the fenestra rotunda is the only part of the wall that is elastic. Hence when this membrane loses its elasticity and becomes thickened the vibration of the foot plate of stapes is very limited. Then we have impairment of hearing.

When the Eustachian tubes are healthy they are opened at each act of deglutition and air is forced into middle ear; but such is not the case if a mass of this diseased tissue is in the opening of tube or presses against the pillars of the same. A foreign substance will remain doubly as long in the anterior nares as it will in the posterior nares without becoming putrid. Hence this rhinopharynx should not be kept open, especially as a current of fresh air is nature's deodorizer and disinfectant, and will do more good in overcoming the effects of adenoids than any medicine one can use in the nose. Thus a free current of air through nasal cavities is very important. It keeps the parts clean, and "cleanliness is next to "Godliness." A diseased child is seldom good.

"Nightmare" is a symptom. When a child wakes up in the night screaming and crying, or wanders off quietly, or walks in some dangerous place—that child is not awake; only the lower centers are awake. The higher centers are poisoned from want of proper nourishment in the brain, and are dormant, while the lower centers are being irritated by this poison from the blood. Why are these poor creatures allowed to suffer and go through life handicapped?

1st. Because the child does not know what to complain of, and, if asked, would say he is not sick.

2nd. Because his parents, grandparents, etc., were not treated for this trouble and went through life with a nose that was worse than useless.

3rd. The family physician rarely thinks of looking in the rhino-pharynx for the trouble. Even when called in, he simply prescribes a nose-wash and goes on with a clear conscience, thinking the child has a cold in the head.

So these children drift on with this disease until some worse disease takes its place.

Treatment is simple. Remove the diseased tissue. There are many kinds of forceps and curettes, but for small children the Quinnalin forceps seems to be the ideal instrument.

RECAPITULATION.

When a child has the apathetic expression, breathes through his mouth, snuffles, holds his head back, cannot hear well, the upper teeth overlap, palate is arched, is dull and stupid at books, walks in his sleep, has nightmare, is fidgety and restless, and does not grow as a child should, look into the rhino-pharynx and generally you will find the weight that drags him down.

SOCIETY PROCEEDINGS

BROOKLYN PEDIATRIC SOCIETY

Regular meeting of the Pediatric Section, held Friday, June 12, DR. FRANK W. SHAW, Chairman.

SCIENTIFIC PROGRAM.

TREATMENT OF ACUTE GASTRO-ENTERITIS, DR. GEO. F. LITTLE:—In the series of papers for presentation tonight the treatment of acute gastro-enteritis has been assigned to me. The design of this meeting seems to be that we should sharpen our weapons and burnish our shields against the foes that hot weather brings to the little ones. Therefore, while there seems to be some argument regarding nomenclature and classification, I shall consider this subject as synonymous with summer diarrhea.

Whether cholera infantum is, or is not, properly included under this head need not be discussed, as its treatment will be covered by another.

As in many other conditions, an ounce of prophylaxis, in this disease, is worth a pound of drugs. We desire fresh air in allopathic quantities, sunlight, cleanliness, good food and proper method of feeding; together with attention to minor derangements of the gastro-intestinal tract, especially that, usually unnecessary, Satanic heritage—constipation. One of the frequent causes of this latter trouble is insufficient fluid. Infants, like adults, need somewhat less food and more water during the heated term. Thousands of our babies, who are at the breast or upon bottle feeding, receive no water at all. These infants, could they speak, would cry out "Water, water everywhere, but not a drop to drink." This is a field for daily missionary work, impressing also upon the mothers the necessity of boiling the water.

Our prophylactic charities—the seaside homes, fresh air funds, floating hospitals—the free distribution of milk and ice—save hundreds of lives each year. May such work prosper and its usefulness extend! Libraries and college endowments are of good effect, but let us save the children first!

To those who can afford it, and all but the poorest may, we must speak of the certified milk so carefully watched over by our Milk Commission.

Where prophylaxis does not obtain, there treatment must often be instituted. Again, fresh air—in almost all cases keep the little patients out of doors the better part of the day during an attack—in the yard, on the roof, on the fire escape. Shelter them well from the sun and keep them quiet.

Help the skin to eliminate and make the child more comfortable by cool baths twice a day—water at 90° F. cooled to 80° F. These may be employed every three hours if the temperature be high.

At the onset of the disease a cathartic is indicated—castor oil, if no vomiting, calomel otherwise. Of the oil give a teaspoonful to an infant under one year, two teaspoonfuls if over that age; of the calomel give gr. 1-10 every half hour, six or seven doses, followed, two hours later, by a saline, if necessary. A repetition of this, during the course of the disease, may be called for should there be signs of increasing intoxication, the development of nervous symptoms, marked rise of temperature, etc.

All nourishment may well be stopped for at least twelve hours —water being given frequently in small quantities. The concentrated fluid foods may then be used, varying the diet with albumin water and weak animal broths. This change of diet for even twenty-four hours, together with the cathartic, will often abort a severe attack, if used when the mildest symptoms of disturbance of the gastro-intestinal tract appears.

Mechanical treatment in summer diarrhea certainly deserves consideration, prior to the discussion of drugs. In practically all of the cases, I believe that one or more irrigations of the colon are called for. In the more severe types this is something of a *sine qua non*, a thing to be used regularly and to be depended upon for benefit. Such irrigations may be used twice daily until there is marked improvement, then once a day until danger is past.

The technique of this procedure is doubtless familiar to those present, yet it would seem that this paper would hardly be complete without speaking upon such an important subject, for the technique is important. Proper protection of the bed, and arrangements for drainage, dorsal or lateral position, hips elevated somewhat—these matters, of course, pertain, as in adults. A soft rubber catheter—26 to 30 French—is attached to a fountain syringe, and, after being lubricated, is gently inserted. In my first experience with a child, the catheter was inserted numerous times, but its business end invariably popped out of the anus just when it seemed that the instrument had passed far enough. Pass the catheter a couple of inches and then turn on the water; this will stiffen it and open the tunnel ahead. The bag is filled with plain salt water—a teaspoonful to a pint—it is elevated not more than three feet above the patient. The saline solution is heated to 100° F.—107° to 110° F. in collapse. The sigmoid flexure is long in an infant and makes a sharp angle with the descending colon; the tube should therefore be passed upward eight to twelve inches. The irrigation should be free—certainly until the water returns clear, several quarts or a gallon being used. In perhaps the usual method, the catheter is kept in situ, and after a quantity of solution has been injected, it commences to return in spurts alongside the tube. This forcible return would indicate distention, and I do not believe that the unnecessary ballooning of an inflamed gut is to its advantage. Figuring that the colon of an infant of six months holds approximately a pint, at two years two to three pints, it would seem better to inject the estimated quantity and then detach the catheter for some return flow, repeating the process as often as necessary. Where vomiting persists at the beginning of the disease the washing out of the stomach is indicated—one washing often suffices. This procedure may be carried out either in the sitting or prone position. The tongue should be held down by a finger, which is kept in the mouth during the presence of the tube. A funnel and two or three feet of rubber tubing, connected with a soft rubber catheter—21 F. for infants under six months, 25 F. for those older—constitutes the necessary apparatus. An additional eye may be cut in the catheter, care being taken to leave no rough edges. The patient's hands must be confined by a blanket pinned closely to the body. The catheter, after being moistened, is passed eight to ten inches beyond the lips. I am accustomed to use a 1 per cent bicarbonate of sodium solution for washing, from two to six ounces being used in each filling of the stomach. Older children do not bear this process well—they may be persuaded to drink a quantity of saline solution, lukewarm. This is nauseating and effects a partial washing.

With respect to drugs—opium is the most used and the most abused. It lays a soothing hand upon the right case at the right time, chokes Dame Nature off in her efforts to eliminate, in the wrong case, or at the wrong time. It must not be given as a part of regular treatment, but only when a distinct necessity for it arises, as when the diarrhea is excessive and not controlled by other means. Especially when the stools are large and watery, or when pain is excessive, it is required. Yet never until the intestine is well cleansed by frequent movements and by irrigation. It is contraindicated when the number of stools during the twenty-four hours is not large, and if their odor be very offensive, certainly cleaning out is necessary, not the checking of peristalsis by opium. Holt wisely says that it must *not* be given when cerebral symptoms and high temperature coexist with scanty discharges.

In the fluid form I prefer the camphorated tincture—m vi. every two hours for several doses, then every four hours, for a child a year old. In the solid form, Dover's powder is convenient as

℞
Hydrarg. chlor. mite.......................gr i
Pulv. Doveri ....gr iij
Bismuth Subnit............................ʒi
M. et div. in chart No. xii.

This is used at same intervals and age as above. Morphia may be used hypodermatically in doses of gr. 1-100 at this age.

The subnitrate of bismuth is a drug that I frequently use in these cases. Rather large doses may be given—ten grains every two hours to a child of two years. If the stools are offensive, a grain of salol may be added to each dose of the above. It is remembered, of course, that bismuth will change the color of the stools to a gray or black.

The salicylate of sodium I do not use, as it is liable after a time to upset the stomach—a consummation not to be desired. Astringents and mineral acids may be indicated late in the disease.

Stimulants are necessary when there is much exhaustion. The advisability of bringing whisky or brandy in contact with an already iritated or inflamed gastric mucous membrane is questionable. If the necessity be great and the stomach seems able to tolerate alcohol, a fine cognac is preferable, but good whisky is better than doubtful brandy. At one year, twenty drops may be given in a tablespoonful of water, every two hours. Champagne is to be desired in older children.

Strychnia is of service in doses of gr. 1-300, every three hours, at six months to a year—the dose may be temporarily increased to gr. 1-200.

Nervous symptoms, if developed, are controlled by the bromides—sodium bromide is perhaps best, gr. iij-x, every two hours, well diluted.

In extreme cases, where the amount of fluid lost from the body is large and collapse imminent, the injection of normal saline solution into cellular tissue may save the life—the usual quantity is eight ounces. This may be repeated in twelve hours or less if necessary.

In convalescence the tincture of nux vomica acts well as a tonic—m v. diluted, to a child of two years.

TREATMENT OF CHOLERA INFANTUM.—Dr. W. C. Schoenijahn said that, in comparison with the ordinary types of gastro-intestinal disease in children, true cholera infantum is, to-day, rare. The term is frequently wrongly applied to the severer cases of acute gastro-enteric infection, and to be sure, there is no sharp clinical division between these and true cholera infantum, except the rapidly overwhelming toxemia and abstraction of fluid in the latter condition. This article is restricted to the consideration of the treatment of that type of general choleriform diarrhea which is characterized by constant vomiting, insatiable thirst, high temperature, profuse, serous stools, pinched, sunken features, sunken fontanel, great restlessness followed by rapidly developing collapse, cold extremities, dyspnea, cyanosis, coma and, too often death. In short, the picture is much like that of Asiatic cholera or ptomaine poisoning.

As a rule the disease is secondary to acute gastro-enteritis or supervenes upon a subacute condition. We have here the first keynote in prophylaxis in the proper early management of milk indigestion, gastro-enteritis and even the mildest diarrheas in children. Restricting the term to cases of true cholera infantum, even the best authorities admit that treatment is most unsatisfactory. Severe cases go on to a fatal termination regardless of our efforts.

It is well to remember that these are essentially cases of profound toxic poisoning, and that we are no longer treating the intestinal catarrh or inflammatory condition; that the toxic materials are overwhelmingly depressing to the heart and vaso-motor systems of the intestines through the nerve centers; that the diarrheal discharges are to an extent the eliminative effort of nature, though severely damaging by their drain upon the resources. They are distinctly emergency cases.

The main indications in treatment are: 1st. The emptying of the intestinal tract. 2d. The combating of the effects of the poison upon the heart and nervous system. 3d. The supplying of fluid to the circulation to make up the severe drain of the discharges. 4th. The reduction of temperature and treatment of symptoms as they arise. In considering the first indication we must keep in mind that there is no time to be lost waiting for the action of our favorite cathartics. Stomach-washing and intestinal irrigation must be our mainstays. At least a gallon of salt solution or plain boiled water should be used in the intestinal irrigation, which may be repeated in three or four hours. If the temperature of our patient is very high, ice-cold water may be used for irrigation, or if collapse is already threatening, the water should be hot, as warm as 110° F. By this means we not only remove the offending material from the bowel but aid in combating shock or dangerous temperature, as well as stimulating the kidneys to an elimination of toxic substances. The second indication, the neutralizing of the poisoning of the system is met by the use of stimulants such as strychnia and alcohol, and, as advised by both Holt and Roche, the hypodermatic use of morphine and atrophine. The effect should be carefully noted, repeated small doses being thus safe of administration. For a child of one year it is advised to use not more than 1-100 gr. of morphine with 1-800 gr. of atrophine. These are carefully repeated every hour until arrest or diminution of the vomiting and purging, and improvement in the heart's action and nervous symptoms are secured. We are warned against using morphine where stupor or drowsiness or meningeal symptoms exist, or after the purging has ceased. For our third indication in treatment there seems to be but one reliable procedure. Only by the subcutaneous infusion of fluids can we hope to restore the moisture which the tissues so urgently need. The well-known solution of common salt, about 45 gr. to the pint of sterile water, is used, and at least a half pint is injected every twelve hours. Less than this will do no good, and larger quantities can be used without danger. The bulb syringe is the most reliable instrument for injection, obviating the stoppage of flow sometimes met with in the use of the fountain syringe. If the administration be made slowly, and the fluid is warm, fairly large quantities may be injected with safety. It is hardly necessary to advise asepsis or warn against the entrance of air into the tissues. High temperature is to be controlled by the application of ice to the head, the ice water injections, introducing the tube as high as possible and allowing the water to flow freely in and out; and the graduated bath, repeated as often as every hour if necessary, and continued each time for ten minutes. The temperature of the bath should be 100° F. to begin with, and lowered by means of ice to 85 or even 80 degrees. Friction should be active and the head kept cooler than the body. Another method of lowering temperature which serves the purpose also of a circulatory and respiratory stimulant, is friction over the whole body with a towel wrung out of water at the temperature of the room and sprinkled with common salt. This will be found to be particularly soothing to the nervous system.

During our active treatment, nothing should be administered by mouth except ice, and possibly our alcoholic stimulants. In the stage of collapse with cold extremities and possibly subnormal temperature the warm pack at 100° F., or the mustard pack, or mustard paste covering the while body until thoroughly red, with hot-water bags and bold stimulation, is indicated. The mustard paste is made in the strength of one part powdered mustard to four or six of flour, made into a paste with lukewarm water and spread between two layers of muslin. Its action is usually secured in about ten minutes. It may be used every three hours.

Having weathered the first storm, the return to diet must be particularly gradual, as relapse is an ever present possibility. At first, articles requiring little or no digestion and leaving the smallest residue should be tried. Liquid peptonoids in very small and dilute quantites, whey, koumyss are suggestions. Later one may begin a weak formula of modified milk, increasing the strength gradually. It may be well to begin with fully peptonized milk.

Of medication there is little to be done by mouth. After the first danger has been passed it is well to give a digestive ferment to avoid intestinal decomposition of unpeptonized material. All the so-called intestinal antiseptics have been mentioned as of value, but drugs by mouth are to be avoided. The various forms of bismuth give the best results according to most authorities, but should be given in massive doses to get the proper effect. Ten grains every two hours of the subnitrate, suspended in boiled water, is not considered to much for an infant. It is wise to avoid medication by mouth, however, relying on the other measures outlined to meet the indications.

In discussion, Dr. Edson said that the papers were so complete that they left little to be said. As regards these diarrheas, he had often given the following, with happy results, in the proper stage:

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Ac. sulph. dil.	15 minims
Spts. chlorof.	2 drachms
Tr. opii camph	One-half ounce
Ol. cloves	5 minims
Syr. ginger; to	3 ounces

Dose is one drachm. It does good work. The past two years he had also used a starch lump with brandy. In the main, he agreed with the papers.

Dr. Ager: Opium is used too much; in fact, I question whether it is wise to use it at all. For irrigation, I use a glass tube of my own invention. It is slightly bent two inches from the end, about 15°, three inches further up, is another bend in opposite direction, which gives it a corkscrew shape. When using bismuth, I use the beta-napthol entirely, as it is more astringent.

Dr. Kinne: All of the measures of irrigation are good, but what if you are doing this work among ignorant people? It is not well carried out. I find dilute hydrochloric acid fine, in small doses. It is often well to let a child drink a lot and then vomit, for stomach washing.

Dr. Bartley: It is the wise thing to do to withhold all milk, but where there is no vomiting, give whey and barley water, equal parts. Gradually increase it with or without a stimulant. It is not wise to withhold all nourishment. There is no need to reduce the sugar, the child needs it for heat.

Dr. Little (closing for the writers of the papers): I have nothing to add, except to draw attention to the criticism of opium; in reply to this I call your notice to what was said about it in my own paper. As regards the glass tube mentioned personally, I would not use it. Its use must be attended with danger to a struggling infant.

BRITISH MEDICAL ASSOCIATION

(*Continued from page 627.*)

DISCUSSION ON CHOREA.

I shall leave to subsequent speakers the discussion of other forms of treatment in chorea. Arsenic, in large doses for a short time, sometimes produces distinct improvement, but if its use is continued for more than a week there is danger of producing arsenical neuritis. Dr. Eustace Smith has recently advocated the employment of large doses of ergot. Dr. John Thomson, of Edinburgh, tells me that he has had good results with antipyrin. I say nothing of aids to convalescence, such as massage, the cold douche, and the administration of iron and of other tonics. What I desire to urge is that every case that is looked upon as presumably rheumatic, should at first be kept in bed, and treated vigorously as for rheumatism.

Dr. Henry Ashby, Physician, Manchester General Hospital for Children, said: I agree with Dr. Lees that the rheumatic toxin is the most important factor in the production of chorea, but I am not inclined to the belief that all cases of chorea are rheumatic. Chorea is exceedingly common in overgrown, anemic girls in whom there is no evidence of rheumatism or of heart disease, and I do not think that in this class of cases, salicylates are of much use. The bacteriological evidence is most important, and ultimately the question of the rheumatic origin of all cases of chorea will be finally settled by this means. The observations of Dr. Lees on the treatment of chorea by large doses of salicylates are very important. I confess I am somewhat frightened of such doses as he recommends. I am inclined to think that more moderate doses of some 40 to 60 gr. daily are likely to do all the larger doses will, and with less risk. Antipyrin in moderate doses is certainly useful in acute cases. Arsenic is of doubtful value, and in large doses almost certainly harmful. After all, rest in bed and careful dieting are the most important essentials in the treatment of chorea.

Dr. Theodore Fisher, Physician to Out-patients, Bristol Hospital for Sick Children, said: The few remarks which it has occurred to me may be worthy of bringing forward in connection with this discussion, deal chiefly with the question of the frequency of serious cardiac lesions as a sequel of chorea. After two years or more had elapsed from the time of the onset of the acute attack Osler looked up 140 cases, and found in 72 signs of organic disease. Osler mentions also Stephen Mackenzie, who in 33 cases which were examined after the lapse of two years, found 60.6 per cent. affected with cardiac lesions, and Donkin, who in 44 cases found 18 similarly affected at the end of the same time.

I have traced 53 cases of chorea that have been under my own care, but have excluded all those in which the time of onset of the chorea was not more than three years before the time of examination. Of these 53 cases, 32 presented no murmurs, with the exception in a few instances of a pulmonary murmur, probably due to anemia. Murmurs obviously due to organic disease were heard in 18 instances, and with these must be classed 2 cases which had died obviously of cardiac disease, making 20 in all in which serious cardiac lesions were or had been present. In the 53d case a systolic murmur was audible at the apex and another at the base. The nature of the apical murmur was somewhat doubtful. It may or may not have been due to anemia, from which the girl to some extent suffered. Of the murmurs obviously due to organic disease, 9 were presystolic, 8 mitral systolic, and in 1 to-and-fro aortic murmurs were present.

In passing it may be mentioned that the fact that in only 9 cases a presystolic murmur was audible is a point of some interest. Inflammation of the mitral valve, if it result in permanent defect, almost invariably by degrees produces stenosis of the mitral orifice. Puckering of the mitral valve cusps, allowing regurgitation only, may almost be described as a myth. It is scarcely necessary to remark, however, that a stenosed mitral orifice, with very few exceptions, allows regurgitation, and the systolic murmur due to this regurgitation may not uncommonly be the only murmur heard. Possibly in some of the 8 cases in which only a systolic murmur was heard, mitral stenosis may have been present, but that nothing more than dilatation of the left ventricle, in which the mitral orifice shares, need exist in such instances, was shown by one of the fatal cases. A girl aged eleven years, who had been seen by me at the Bristol Children's Hospital suffering from chorea, died in the Bristol Royal Infirmary seven years later of cardiac disease. The heart was found to present general dilatation, as well as hypertrophy. It weighed 14 oz., but no deformity of any of the valves was present, although, as sometimes happens after rheumatism, the small granulations of the early endocarditis had become organized, and still lined the margins of all the valves, those of the right side of the heart as well as those of the left. The only other noteworthy feature was the presence of some pericardial adhesions at the apex of the left ventricle. Unfortunately, I was away at the time of the necropsy, and had no opportunity of examining the cardiac muscle, but there can be little doubt that in such a case the main disease was in the heart wall.

A point to be considered in connection with the frequency of cardiac lesions following chorea is the occurrence of rheumatism. Of the 32 cases in which no murmurs were heard, in only 6 cases a history of definite rheumatism or of pain in the joints could be obtained, whereas in the 20 with cardiac lesions rheumatism had been present in 8. Osler''s statistics on this point are very similar. Another question to be considered is whether repeated attacks of chorea are more likely to result in damage to the heart than one attack. Curiously enough, of 14 of my cases that had only one attack, 7—that is just half—had cardiac lesions, whereas in some in which attacks had been frequent the heart remained healthy. Thus the heart remained healthy in one case where there had been six attacks of chorea, and in another where there had been seven. In 15 of Osler's cases in which there had been three or more attacks, the heart remained healthy. A fact which also seems to me to be noteworthy is that of the 20 cases with permanent cardiac lesions, in 13 I examined the heart when the patient was suffering from the first or only attack of chorea, and in only one of those no apical murmur was to be heard.

Some of these last-mentioned details seem to suggest that if the heart escapes during the first attack of chorea it is not likely to suffer during any subsequent attack. It is necessary, however, to consider in this connection the importance of murmurs heard during the acute stage of chorea. Murmurs are frequently heard both at the apex and at the base. The basic murmur, which was present in 23 of my cases when they were first seen, is not uncommonly described as hemic, and an associated systolic apical murmur may be considered to be of the same nature. It is not necessary, however, to conclude that these murmurs, when heard in cases of chorea, have any connection with anemia. A loud pulmonary murmur can certainly occur when there is no anemia, and may be so loud that, when conducted to the right of the sternum, it may be mistaken for an aortic systolic murmur.

(*To be continued.*)

EDITORIAL

CHILDREN'S DISEASES IN LARGE CITIES

One of the most systematic and thorough investigations of the relations of milk supply and infantile diarrhea has been carried out in New York City under the auspices of the Rockefeller Institute and the Board of Health, under the guidance of Drs. W. A. Park and L. Emmett Holt. Their paper was read before the Association of American Physicians, and we here desire to present some of the conclusions there advanced. We hope to give our readers the paper in full in our December issue.

In addition to the statistical reports of their observations, the different physicians who watched the infants in their homes were asked to state their own conclusions regarding the general problem of infant-feeding in the tenements. These general impressions are most suggestive and cannot fail to be of interest to all who are working at this difficult problem.

It was practically the unanimous opinion that the most important factor in securing good results is intelligent care. This covers much: clean bottles and nipples; the willingness and ability to carry out directions as to methods of feeding, quantities, frequency, the stopping of milk at the first signs of serious diarrhea, etc.; proper care of the milk itself while in the house, and methods of sterilizing, and as much fresh air as possible.

Most of the physicians stated that, leaving out the very worst store milk in summer, the results were much less affected by the character of the milk than they had anticipated, and distinctly less than by the sort of care the infants received.

The surroundings alone had much less influence on results than was anticipated. For not only were breast-fed infants found doing well under the most unfavorable surroundings, but those also who received only the bottle as a rule did well, provided they received intelligent care and good milk.

The depressing effects of great atmospheric heat, *i.e.,* a temperature in the neighborhood of 90 degrees F., or over, were very marked in all infants no matter what their food. Those who were ill were almost invariably made worse, and many who were previously well became ill. A bad method of feeding, or rather a feeding without any method, was responsible for many failures when the milk itself was of good quality. Common mistakes were, feeding an infant every time it cried; giving it a full bottle no matter what the age of the child, and letting it take as much as it would; preparing a large bottle of food at one time, and warming it over from time to time until the child had taken the whole of it, or allowing the milk to turn sour in the feeding bottle. Quantities proper for single feedings were almost invariably disregarded. Proper washing of feeding bottles was seldom seen in a tenement house. Such matters as these are closely connected with intelligent care, which has been already considered.

The importance of the matters just mentioned, raises the question of how much can be accomplished by the distribution of printed slips of directions. It was the observation of the physicians that comparatively little can be accomplished by these alone. Such printed circulars are often treated by the tenement-house mother very much as most of us treat the printed advertisements which are left at our doors—seldom read and soon thrown away. Mothers are often anxious and willing, but ignorant and stupid. Many cannot read and many more have not the wit to apply in practice what they read. When, however, such printed advice was preceded or accompanied by personal explanation, it was found of great assistance. Personal contact is the only sure way to influence these people, and this must be frequently repeated to influence them permanently; as an aid to this, printed slips are useful. Printed directions, however, should be as simple as possible in statement, few in number, and touch only the most vital matters, telling the mother always what she is to do, not what she is not to do.

MILK SUPPLY AND CHILDREN'S DISEASES

Continuing the analysis of their paper *in toto* Drs. Park and Holt say that as a result of the observations they have made, the conclusions drawn relate especially to the more immediate effects of the milk.

1. During the cool weather neither the mortality nor the health of the infants observed in the investigation, was appreciably affected by the kind of milk or by the number of bacteria

which it contained. The different grades of milk varied much less in the amount of bacterial contamination in winter than in summer, the store milk averaging only about 750,000 bacteria per c.c.

2. During hot weather, when the resistance of the children was lowered, the kind of milk taken influenced both the amount of illness and the mortality; those who took condensed milk and cheap store milk did the worst, and those who received breast milk, and modified milk did the best. The effect of bacterial contamination was very marked when the milk was taken without previous heating; but, unless the contamination was very excessive, only slight when heating was employed shortly before feeding.

3. The number of bacteria which may accumulate before milk becomes noticeably harmful to the average infant in summer, differs with the nature of the bacteria present, the age of the milk, and the temperature at which it has been kept. When milk is taken raw, the fewer the bacteria present the better are the results. Of the usual varieties, over 1,000,000 bacteria per c.c. are certainly deleterious to the average infant. However, many infants take such milk without apparently harmful results. Heat above 170 degrees F. (77 degrees C.) not only destroys most of the bacteria present, but, apparently, some of their poisonous products. No harm from the bacteria previously existing in recently heated milk was noticed in these observations unless they had amounted to many millions, but in such numbers they were decidedly deleterious.

4. When milk of average quality was fed sterilized and raw, those infants who received milk previously heated did, on the average, much better in warm weather than those who received it raw. The difference was so quickly manifest and so marked that there could be no mistaking the meaning of the results. The bacterial content of the milk used in the test was somewhat less than in the average milk of the city.

5. No special varieties of bacteria were found in unheated milk which seemed to have any special importance in relation to the summer diarrheas of children. The number of varieties was very great, and the kinds of bacteria differed according to the locality from which the milk came. None of the 139 varieties selected as most distinct among those obtained, injured very

young kittens when fed in pure cultures. A few cases of acute indigestion were seen immediately following the use of Pasteurized milk more than thirty-six hours old. Samples of such milk were found to contain more than 100,000,000 bacteria per c.c., mostly spore-bearing varieties. The deleterious effects, though striking, were not serious nor lasting. At the present time there is in New York City, no general sale from stores of "Pasteurized" or "sterilized" milk, so that it is here very rare for such milk to be used thirty-six hours after heating.

6. After the first twelve months of life, infants are less and less affected by the bacteria in milk derived from healthy cattle. According to these observations, when the milk had been kept cool the bacteria did not appear to injure the children over three years of age, at any season of the year, unless in very great excess.

7. Since a large part of the tenement population must purchase its milk from small dealers, at a low price, everything possible should be done by Health Boards to improve the character of the general milk supply of cities by enforcing proper legal restrictions regarding its transportation, delivery and sale. Sufficient improvements in this respect are entirely feasible in every large city to secure to all a milk which will be wholesome after heating. The general practice of heating milk which has now become a custom among the tenement population of New York is undoubtedly a large factor in the lessened infant mortality during the hot months.

8. Of the methods of feeding now in vogue that by milk from ventral distributing stations possesses the most advantages, in that it secures some constant oversight of the child, and since it furnishes the food in such a form that it leaves the mother least to do, it gives her the smallest opportunity of going wrong. This method of feeding is one which deserves to be much more extensively employed, and might, in the absence of private philanthropy, wisely be undertaken by municipalities and continued for the four months from May 15 to September 15.

9. The use, for infants, of milk delivered in sealed bottles, should be encouraged whenever this is possible, and its advantages duly explained. Only the purest milk should be taken raw, especially in summer.

10. Since what is needed most is intelligent care, all possible

means should be employed to educate mothers and those caring for infants in proper methods of doing this. This, it is believed, can most effectively be done by the visits of properly qualified trained nurses or women physicians to the homes, supplemented by the use of printed directions.

11. Bad surroundings, though contributing to bad results in feeding, are not the chief factor. It is not, therefore, merely by better housing of the poor in large cities that we will see a great reduction in infant mortality.

12. The observations indicate that close percentage modification of milk, although desirable in difficult cases, is not necessary to obtain excellent results with the great majority of infants, and that a certain adjustment of a healthy infant to its food is usually soon secured.

13. While it is true that even in the tenements the results with the best bottle-feeding are nearly as good as average breast-feeding, it is also true that most of the bottle-feeding is at present very badly done, so that as a rule the immense superiority of breast-feeding obtains. This should, therefore, be encouraged by every means, and not discontinued without good and sufficient reasons. The time and money required for artificial feeding, if expended by the tenement mother to secure better food and more rest for herself, would often enable her to continue nursing with advantage to her child.

14. The injurious effects of table food to infants under a year old, and of fruits to all infants and young children in cities, in hot weather, should be more generally appreciated.

ABSTRACTS

Breast Milk: Cow's Milk as Affected by Alkalies and Other Antacids.—The result of examinations made by KERLEY, GIESCHEN and MEYERS (*Medical Record,* August 8, 1903, p. 201) showed that variations in litmus paper used to test the acidity of cow's milk is not to be depended upon as heretofore.

In the case of cow's milk, the methods of examination was to determine, first, the fat and total solids and, then, the reaction to *neutral* litmus paper. Breast milk was pumped into sterile breakers and tested with red and blue litmus paper at once. Ten c. c. of milk was then placed in two dishes and one drop of phenolphthalein solution added. Lime water was then added with a pipette graduated to 0.1. c.c. The results are tabulated, and it is shown that not a single specimen of breast milk required less than 8 per cent of lime water to render it alkaline, while many required over 20 per cent; cow's milk required 45 to 95 per cent; while certified and laboratory milk required more limewater to render them alkaline than "grocery milk."

Another point brought out was that lime-water and a sodium hydrate in solution required more lime-water than sodium hydrate solution to render the milk alkaline.

It was found that other salts, such as carbonate of potassium, borax, and phosphate of sodium retarded or inhibited the formation of curds with rennet.

A detailed account of the work and principles involved is given, a wide variation in results being obtained from the use of two lots of litmus paper.

The conclusions arrived at are:

1. Breast milk and cow's milk are both acid.
2. The litmus paper test for milk is unreliable because of the variation in the quality of litmus paper, and the litmus taking part in the reaction and not acting as an indicator.
3. The effect of adding lime-water or bicarbonate of sodium to feedings is to retard or inhibit the formation of curds by rennet.
4. The teaching that lime-water, bicarbonate of sodium, or carbonate of potassium should be added to fresh milk or feedings simply because they are antacids is erroneous.
5. The addition to milk or feedings of alkalies or salts that become alkaline in solution is an empirical method of aiding digestion by preventing the formation of dense curds that would slowly leave the stomach and be difficult of digestion in the intestine.

Infant Feeding.—This paper of ROTCH'S (*Journal of the American Medical Association,* August 8 and 15, 1903, p. 354) runs through two numbers, the first part setting forth the range of the subject discussed: human breast milk and its analysis, with the comparative analysis of mammal's milk—as found in different breeds of cows. · The action of heat in destroying germs leads up to what he has to say about compositions of milk, and a table is given showing the proportion which must always be adhered to in modifying milk for a substitute feeding. In creams also the same proportion of fat, sugar, and proteids, and the alkalinity and temperature should be carefully preserved. He then speaks of variations of digestion both in normal infants, who may show idiosyncrasies that must be met, and in abnormal infants.

Proprietary food, he remarks, contain large amounts of starch, which disturbs digestion, especially in very young babies. A table showing the combinations possible in whey-cream mixtures accompanies these remarks, which conclude with the observation that the breed and care of the cow and of the stables and of the milkers on the farms especially used for the purpose of obtaining a proper milk supply for substitute feeding, is the keynote to success.

In the latter part of his paper the author speaks of milk laboratories as standing in the same relation toward milk as apothecary shops to drugs, only to be dispensed and sold under the direction of a physician. The materials necessary to carry out the physician's prescriptions in these laboratories are then enumerated, and the difficulty associated with the home modification of milk from ignorance in regard to the percentages, discussed. As an offset to this latter difficulty he recommends Dr. Ladd's card for home modification, quoting the results of Edsall's analysis as proof of the accuracy of Ladd's table.

Percentage feeding, he says, means that each individual infant must be studied by itself, care being taken as to the quality and source of the milk; heating milk; in the addition of lime-water, and preserving the proper percentage of fat, sugar and proteids.

Subtropical Trachoma.—In his paper, WRIGHT (*Journal of the American Medical Association,* August 8, 1903, p. 361) sets forth the clinical aspect of this affection, basing his consideration of the disease on the following hypotheses:

1. Trachoma is a distinct disease, characterized by a granular and hypertrophic condition of the palpebral conjunctiva and its transition folds, usually with signs of ulceration.
2. It tends to progress in a fixed manner, varying only in degree.
3. Certain complications and sequelæ mark its course and termination.

4. Trachoma is contagious. It is a separate and distinct disease from follicular conjunctivitis.

5. It is capable of being beneficially modified, even cured, by appropriate early treatment.

He has come to the conclusion, from personal observation, that this disease is milder, less frequent and less disastrous in its final results in the south than in older countries. He has seen only one negro boy, aged five years, who exhibited anything like true trachoma, and this proved to be an outcome of a previous attack of opthalmia neonatorum, while in New York City, children suffering from trachoma are excluded from public schools, the laws of the United States recognizing this to be a contagious disease.

The author advocates copper citrate for the treatment of this affection, and claims for it the following points:

1. It produces absorption and disappearance of granulations and hypertrophied papillæ quite as rapidly as other applications.

2. It produces less irritation in the lids; less pain and discomfort to the patient.

3. Important, and a corollary to its almost painlessness, patients will use it regularly in home-treatment. Even a nervous mother will apply it in the eyes of her spoiled darling. What greater encomium can be pronounced on a treatment of trachoma! For, he says, we all recognize the vital importance of systematic daily application in the eradication of this treacherous disorder.

As a result of his personal success with this remedy he urges those interested in this subject to give copper citrate a trial in trachoma.

Epiphysitis.—A female child of two years was referred to Lord (*Journal of the American Medical Association,* August 1, 1903, p. 305) in whom this condition was present in a form which subsequently simulated congenital hip misplacement. He gives her history and quotes extracts, taken from his correspondence with Drs. Townsend, Whitman and Lorenze, on this condition, in which they all agree that perfect cures are out of the question.

The writer was unable to accomplish anything in this case by the Lorenz bloodless method. The Lorenz-Hoffa cutting operation was then done, which revealed a healed funnel-shaped depression over the capsular ligament, indicative of the site of the former sinus. A dissection into the former capsule showed this to be a closed cavity, practically a dense ligamentous structure, which precluded an approximation of the trochanters and acetabulum. The operation, therefore, was a failure, as is always the case in young infants where the head and neck of the bone are largely cartilaginous and in a condition favorable to be destroyed completely, except as recommended by Townsend, i.e., as excised hips, by an extension sole to lessen the limp, and the inevitable scoliosis resulting from a tilted pelvis, would appear to be about all that can be done in some of these unfortunate cases.

Epispadias.—DR. JAMES B. BULLITT (*Journal of the American Medical Association,* August 1, 1903, p. 297) reports a case operated on by a modification of Cantwell's method, an operation which seems not to have gained the recognition it deserves. Its object is the transplantation of the newly-formed urethra to its normal situation beneath the body of the penis. It permits a quick result to be obtained, and relieves entirely or in a marked degree, the distressing incontinence, the whole procedure occupying two weeks if healing by first intention occurs.

Cantwell recommended that the operation be not undertaken under ten years of age, but Parham and Martin report a case of a child only five years of age, and Dr. Bullitt's patient was a boy of seven years, which he describes in detail.

A Possible Case of Infant Poisoning.—DR. CHESTER J. STEDMAN (*Medical Record,* September 5, 1903, p. 377) reports the case of a child of seven months who showed evidences of poisoning after nursing. Investigation revealed the fact that the mother had taken a dose of salts that day, to open her bowels, which failed to act, and had also been very much worried. The author submits this case as a suggestion of the possibility that the digestive disturbance of the breast-fed infant may have been secondary to the aforementioned physical and mental condition of the mother.

Hydrophobia.—The symptoms and diagnosis of this disease, set forth by PRITCHARD (*The Medical News,* August 15, 1903), are the outcome of a renewed general interest in this subject.

The symptoms indicative of the affection, he says, may not be present until after the wound has healed, though usually before. They are lassitude, a malaise, perhaps slight feverishness with depression of spirits and nervous irritability, and simultaneously recrudescence of irritation at the site of the original bite, slight redness with pain and some stiffness with paresthesia which extends sometimes along the centripetal direction of nerve or blood vessel, or both, involving sometimes the lymphatics, producing the first great mental anxiety. The temperature usually does not exceed 101°-102° F.; pulse is somewhat accelerated; face is alternately flushed and pallid, terminating after two or three days in the convulsive stage. This second stage is also accompanied by difficulty in deglutition; stiffness of the neck muscles; marked thirst and, finally, paralysis.

The following points he has found more or less constant in the differential diagnosis:

In pseudo or hysterical hydrophobia, the incubative period is either much shorter or much longer than in the true disease, symptoms developing within a day or two after a bite being almost certainly hysterical, in which condition there is no first or second stage. The crucial test is the Pasteur inoculation.

Tetanus is distinguished from hydrophobia by the greater prominence of trismus; the cause is a wound, not a bite; absence of remissions in the convulsions and also of mental symptoms, thirst, terror, dribbling of saliva and by the shorter period of incubation.

Hydrophobia.—A review of some of the recent literature of the etiology, pathology and prophylaxis of hydrophobia, made by FIELDING LOUIS TAYLOR (*The Medical News,* August 15, 1903, p. 289) shows that in regard to:

1. Age and Sex.—More males than females are affected, two-fifths of all cases being under fifteen years of age.
2. Location of Bite.—Those on the face and hands produce the disease more often than those on parts covered by clothing.
3. Statistics of Frequency After Bites by Rabid Animals.—Sixteen per cent of these contract the disease.
4. Prevalence.—In Lancashire, Eng., Ireland, and certain parts of France and Germany the disease is fairly prevalent, while in Australia and Norway it is not found.
5. Period of Incubation.—This seems to vary according to the susceptibility of the patient, the virulence of the disease in the animal inflicting the bite, the amount of virus introduced, and the position of the bite.
6. Causation.—The disease is due to a living organism which affects the nervous system chiefly.

He recommends for general prophylaxis:

1. Destruction of stray dogs.
2. Dissemination of literature among police and people concerning the necessity of trying to capture instead of killing dogs that have bitten anyone, or are supposed to be rabid.
3. Muzzling of dogs as is done in Germany.
4. Ligating and cupping the wound; excision of the tissues in its neighborhood, or cauterization with nitric acid.
5. Simple or intensive inoculations of "virus fixe."
6. The use of serum therapy to prevent the disease and confer a certain degree of immunity.

Laryngeal Stridor..—DR. JAMES E. NEWCOMB (*Medical Record,* July 25, 1903) has seen three cases diagnosticated as the so-called congenital laryngeal stridor, and has read all that has been written on this subject to substantiate his remarks. He iterates the names used to designate this condition, the symptomatology of which has been too rigidly set down in text-books but not observed in one of the writer's three cases. The malady, he has found, seems to predominate in male babies. The causes of the condition are not always easy to find, although by some rachitis is thought to be at the bottom of the trouble. In weakly children the condition may lead to thoracic distortion, and may prove fatal.

Differential diagnosis is called for from laryngismus stridulus, which is favored by the onset of the first dentition. Stridor comes on soon after birth, is slight, and there is no cyanosis.

He quotes the treatment advised by Robertson, who recommends the use of ammonium bromide, alkaline sprays, and resorcin in mineral oil, and in clearing out the pharynx and nasopharynx before secondary contracture sets in; of Variot, who suggests partial resection of the aryepiglottis folds if dyspea should ensue and threaten life; and Merklen and Devaux, who accept a general tonic régime to be all that is called for, using bromides, strychnine, warm baths, eucalyptus inhalations, and antisepsis of the upper air tract.

In closing, he summarizes the cases of two boys, now thirteen and nine years respectively. The first suffered with this affection from birth, when it was extremely severe, and is still temporarily discomfiting after any kind of exercise. The other was first troubled with stridor a day or two after birth, lasted three or four weeks and stopped of itself without treatment.

Influence of Heredity on the Eye.—DR. JOHN E. WEEKS (*Medical Record,* Aug. 8, 1903, p. 205) cites a number of instances in which the eye is affected by the transmission from parent to child of peculiarities of form and function, of tendencies to degeneration and to disease; by far the most common cause being hereditary syphilis.

Epicanthus, he remarks, is a racial peculiarity in the Mongolian race; this and ptosis being the only congenital peculiarites that are hereditary.

Other hereditary affections are Coloboma of the iris, aniridia; coloboma of the choroid; malformation of the globe; cataract of the lens; optic nerve atrophy; hemeralopia and retinitis pigmentosa; glaucoma; congenital glaucoma or hydrophthalmus. Polycoria he believes is seldom if ever hereditary and inherited peculiarities of the cornea are extremely rare, as is also albinism.

A list of affections of the eye due to inherited syphilis, from which girls suffer more severely than boys, is appended.

Thus it may be seen from this paper that heredity influences the eye in respect to form and disease in no inconsiderable degree.

Treatment of Scarlet Fever, Its Complications and Sequelea.—In speaking of the cases, McClanahan (*Jl. Amer. Med. Ass'n,* July 4, 1903, p. 31) designates them as malignant, mild, severe and septic. He then gives general principles of treatment which apply equally to all cases.

A liquid diet, consisting of milk, thin broths and fruit juices, an abundance of water, together with carbonated waters, weak lemonade, orangeade, etc., according to the age of the patient, should be continued for four weeks at least.

Rest in bed is imperative, and should be insisted on, especially in mild cases, to guard against nephritis. In severe cases it does not require so much attention, as the patient is more inclined to remain in bed.

In regard to local treatment he has little confidence that it will prevent otitis media and he relies on moving the bowels freely and as soon as vomiting has ceased giving some mild aperient. When vomiting needs special attention he simply withholds food for from 12 to 24 hours and a simple fever mixture of liq. ammon. acet. may be given for a few days.

To control the fever should it exceed 104, he places hydrotherapy first. Then sponging with cool water; the application of a towel dipped out of warm water about the child's body, outside of which are several thicknesses of towel wet with cold water; cooled bath followed by gentle friction of the body, after the child has been in the bath for eight to fifteen minutes; all serve as antipyretics. Two or three grains of sodium salicylate he has found softens the skin and lowers the temperature.

Sedation may be accomplished, he thinks, by the use of two grains of chloral hydrate, every two hours for four or five doses, modified by digitalis if necessary; applications of the cold compress or ice poultice in extremely nervous patients.

In septic cases the author gives stimulants at regular intervals, being guided by the heart in the use of strychnine or other cardiac stimulants.

He advises oily applications to hasten desquamation, a 1 per cent. solution of carbolic acid to relieve itching, and when fever has subsided, a daily bath with soap and water.

Glandular involvement requires surgical intervention. Cellulitis is a serious but rare complication.

The heart should be carefully watched and if scarlatinal arthritis becomes manifest, a salve of sodium salicylate 1 dram, lanolin 4 drams, simple ointment 4 drams, is applied to the joint, which is covered by a layer of cotton and held in place by a roller bandage.

The treatment of otitis media is important and symptoms are often vague. A warm boric acid solution instilled into the ear and then withdrawn will by frequent repetition give relief. After this the ear is filled with a 50 per cent. solution of peroxide of hydrogen to which a little bicarbonate of soda has been added, then washed out by boric acid solution and the canal dried by absorbent cotton, prompt incision being indicated in involvement of the mastoid cells.

In scarlatinal nephritis the earliest symptoms are swelling beneath the eyes or on the dorsum of the foot, with a lessened quantity of urine, of which frequent examination should be made. A liquid diet, rest, in bed, avoidance of stimulating diuretics and the increasing of the function of the skin and bowels constitute the treatment.

Influenza.—DR. W. CARVER WILLIAMS (*Jl. Amer. Med. Ass'n,* July 4, 1903, p. 28) cites a number of observations from his own experience and also from the experience of his confreres which goes to prove his conviction that this is a more malignant malady in children than is generally acknowledged. He emphasizes some of the manifestations and possible calamities which may be traced to this disease and gives histories of four cases to indicate how widely divergent may be the chains of symptoms in disease traceable to the Canon-Pfeiffer bacillus, as well as the severity to which they not infrequently attain.

In his conclusions he says:

1. Children of any age, even early infancy, are susceptible to the influenza infection.

2. Repeated relapses and grave sequelæ are frequent in cases where the initial seizure is mild as well as where it is severe. Therefore, no attack should ever be considered as "mild" nor as recovered from until a sufficient time has elapsed.

3. Clinical diagnosis should always be supported by the evidence of the microscope, whenever possible, as the practical certainty thus obtained may be of great value in explaining future developments.

Chronic Interstitial Nephritis.—A lengthy description of this condition is given by DR. JAS. E. H. SAWYER (*The Birmingham Med. Review,* August, 1903), who has collected from many different sources, all those cases which seem to be true examples of the disorder, and by making a careful study of the history, symptoms, and pathological changes in each case.

Under etiology he gives a table showing the rarity of chronic interstitial nephritis under the age of twenty. Of twenty-four cases, observed by the author, 10 were males and 14 females. He is of the opinion that the contracted granular kidney is the result of a primary growth or proliferation of the intertubular connective tissue. He goes on to discuss the part played by heredity, specific fevers, urinary obstruction as ascending nephritis and syphilis, in the causation of this condition, and comes to these conclusions:

(1.) That the chronic interstitial nephritis of children is more frequent in males than in females.

(2.) That the changes in the kidneys are not a further stage of parenchymatous nephritis, but are the results of a primary inflammation of the interstitial tissue of the organs.

(3.) That the disease is rarely caused by scarlet fever or any of the specific fevers.

(4.) That the disease may be congenital in origin.

(5.) That it may owe its origin to congenital and inherited peculiarities of constitution.

(6.) That the disease may be due to an "ascending nephritis," starting in the pelvis of the kidney. The dilatation of the ureters and of the pelves of the kidney may, however, be secondary to the interstitial change.

(7.) That syphilis, either hereditary or acquired, may be the chief factor in the causation of the chronic interstitial nephritis of childhood, and may play a greater part in the etiology of the disease in adults than is usually attributed to it.

Section II. covers morbid anatomy—the kidneys, heart, arterial system, brain, etc., which description is very similar to that of the disease as it is found amongst adults, differing only in some minor points.

To this article are appended photomicrographs taken of the kidneys of a subject.

Subcutaneous Injections of Gelatine.—Several cases of hemorrhage in children stopped by the subcutaneous injection of gelatine, in 2 per cent. to 10 per cent. solutions, are reported by Zuppinger (*Wiener Klinische Wochenschrift,* XV. Jahrgang, No. 25, Dec. 25, 1902). The results obtained were very good. Its use in Melana, epistaxis, purpura, scurvy, etc., is advisable. Do not use ordinary gelatine, but rather sterilized.

Pathology and Treatment of Chorea.—Dr. Lees (*British Medical Journal,* Aug. 29, 1903, p. 449) discusses the pathology of this common disease, which, he says, seems to be a disorder of the whole cerebral cortex, probably of the whole brain, possibly of the nervous system in general, sufficient to produce very definite symptoms, and often lasting for a long time. He draws special attention to the fact that chorea is often the first of a series of rheumatic attacks. He suggests that possibly the diplococcus causing rheumatism is also responsible for the production of chorea.

As to treatment, he remarks that, if in the majority of cases chorea means a brain infected with rheumatic diplococci, the treatment which cures rheumatism ought to cure chorea; and the lack of success following the administration of medicine may be because the doses are too small.. In addition to rest in bed, nursing and feeding, he administers sodium salicylate, 10 gr. for a child from 6 to 10 years of age, with 20 gr. of sodium bicarbonate. After two or three days more they may be increased to 20 gr. and 40 gr. These doses should be given every two hours during the day and every three hours during the night, keeping a careful watch for any symptoms of salicylate poisoning and especially for a deep inspiration.

Every choreic child should be kept for a time completely at rest. A cot with padded sides is necessary in severe cases, and the most careful and efficient nursing is essential. It may be needful to give hypnotic drugs, as chloralamide, chloral or bromide, but can be avoided if large doses of salicylate and bicarbonate are used.

In acute cases this treatment is often very successful, but in chronic it is less certain, as it is not always possible to get rid of an effect by removing a cause. Where the cortical centers have been severely affected, time may be an essential factor in their recovery.

Only one case is given to illustrate these views, but he urges that every case should be looked upon as rheumatic, should at first be kept in bed, and treated vigorously as for rheumatism.

The Relation of the Thyroid Gland to Marasmus.—The pathology of infant life has been to a certain extent a very much neglected field and offers ample scope for research and study. RUHRAH (*British Medical Journal,* Aug. 9, 1903, p. 455) calls attention to the fact that the necropsies show so little, and he believes that many of the cases in which there was "nothing abnormal noted" come under the head of marasmus. His deductions are based on about 85 necropsies, 23 of which form the basis for his conclusions, which are:

(1.) Atrophy of the thymus gland is always found in cases of infantile atrophy.

(2.) The condition of the thymus is an index of the general nutrition of the infant.

(3.) The state of the nutrition in infants may be estimated by a microscopic examination of the thymus at necropsy.

The Age for Operating in Cleft Palate.—There is a considerable difference of opinion amongst surgeons as to the most suitable age for operating for cleft palate. Some delay operating until the child is between three to six years of age; others, again, operate during the first few weeks of life.

The object of this note is to express the opinion of MURRAY (*British Medical Journal,* Aug. 29, 1903, p. 456) upon the subject.

In the case of a child born with cleft palate he thinks that the sooner the cleft is closed the better; at the same time, he adds, "It is often wise to effect a compromise between that which is theoretically most desirable and that which is practically most advantageous." Since the main object with which an operation for the closure of a cleft of the palate is undertaken, is that the powers of speech may thus be rendered more perfect, delay until after the child has learned to talk renders this object difficult to obtain. If the cleft involves the bones of the hard palate, articulation will never be perfect. The same holds good in regard to the posterior structures of the palate.

If it is true, he says, that provided a cleft of the soft palate is closed before the child has learned to talk, the result will be perfect, it follows that the operation for the closure should take place somewhere between the time of birth and the second year, provided the health of the child will permit of it, the later the better.

In a case of cleft palate and hare-lip the author has found it a mistake to operate upon the palate before operating upon the lip. When there is a complete cleft both of the lip and of the palate, he operates on the lip when the child is about three or four weeks old, and the hard and soft palate about the end of the second year.

Congenital Dislocation of the Hip.—In order to arrive at just conclusions as to the best method of treatment BURGHARD (*British Medical Journal,* Aug. 29, 1903, p. 457) first mentions the anatomical changes met with and then discusses the methods at present in vogue, *i. e.,* the Hoffa-Lorenz, the author's own method, Lorenz's "bloodless method," all of which aim only at the reduction of the dislocation.

The following conclusions are drawn from these considerations:

(1.) That all cases should be checked by radiography, and that no "cure" should be spoken of that is not a true and anatomical one.

(2.) That all cases of congenital dislocation under fourteen years of age should be submitted to treatment. In the great majority improvement will result, while in some a true anatomical cure is brought about.

(3.) That in all these cases Lorenz's manipulations should be tried in the first instance. Even should they fail to effect reduction they facilitate any subsequent procedures.

(4.) That the prospect of a cure by Lorenz's "bloodless method" is in direct proportion to the youth of the child, and that after four years there is little hope of a true cure by its means.

(5.) That in any case the chances of a true cure by the "bloodless method" are not very great.

(6.) That an operation should be done whenever a radiograph shows that the "bloodless method" has failed to reduce the dislocation, except perhaps in the case of a very young child—under three years—in whom the manipulations may be repeated.

(7.) That with the open operation no fear need be entertained of shock, bleeding, or sepsis.

(8.) That under no circumstances should the joint surfaces be remodelled.

(9.) That an open operation is more calculated to result in a cure, as it enables the surgeon to ascertain beyond a doubt when the head of the bone is really in the acetabulum.

(10.) That the open operation is especially suited for cases over four years of age and for those of bilateral dislocation.

(11.) That after the operation the limb should be put up in the position of maximum stability; in the majority of cases this will be similar to Lorenz's position. The limb should be put up in plaster of Paris immediately and the casing should take in the flexed knee; this is essential in order to insure stability of the head of the bone.

(12.) That all tense structures should be stretched or tenotomized as a preliminary measure a week or so previously to the open operation. The after-treatment is practically identical with that of the Lorenz method.

Infantile Convulsions,—In the *New York Medical Journal* for March 14, 1903, ADAH MCMAHAN states that the treatment of infantile convulsions resolves itself into (1) the treatment of the convulsions, (2) the removal of the exciting cause or causes in the given case, (3) the prevention of any known cause again acting as an irritant, and (4) the strengthening of the infant's unstable nervous system. When first called to an infant in convulsions a few whiffs of chloroform will insure sufficient general relaxation to permit of a general examination, including the taking of the rectal temperature and also the history of the case. Should the diagnosis point to a direct irritation of the cortical cells, then the bromids will be demanded, effective elimination, a room kept well ventilated and darkened, quiet, and proper nourishment. In the so-called reflex irritations, as from improper food, foreign bodies in nose or ears, adherent prepuce or clitoris, or dentition, these causes should be corrected as soon as possible. Te secure sufficient obtunding of cortical sensibilities during the spasm, morphine, 1-20 grain hypodermically, repeated in one to two hours, or choral, three to eight grains to four ounces of warm milk in the rectum should be used. Chloroform may also be used to advantage. The pack, warm or cold, will (1) reduce the pyrexia, (2) increase peripheral circulation, (3) lessen the rigidity, and (4) assist in elimination. Saline infusions are of value where there has been a large drain from the system, as in dysentery or cholera infantum.

An Epidemic of Trichophytosis of the Scalp in School Children.—(*Monatschrift of Prkt. Dermt. Bend* 36, No 38), an epidemic of ringworm in school children in which seventeen out of thirty were affected, is described by WERTHER, 234. A positive source of infection could not be established, but the first case developed in a boy. A possible source of infection, as mentioned by the author, is caull although at the end of his article the growth is identified as Sabouraud's tricophyton of the Cat. The method of Plant (*Münich med. Wochenschr.*, 1902, No. 5, S. 208), is recommended, placing the suspected hairs between a slide and a cover-glass, which is placed on a moist blotting paper in a Peti disk.

Percentage Modification of Milk in Infant Feeding,—It has been stated by LADD (*The Boston Medical and Surgical Journal,* Vol. CXLVIII., No. 1, Jan. 1, 1903), that the use of *whey,* as a diluent in place of water, has of late become very prominent. It has been sufficiently tried to warrant the opinion that, in cases of difficult digestion, its use is of great value, it allowing the physician to give a higher proteid than would be possible otherwise.
5 or 6 days the aerial form of growth from the trichophtic hair give a very typical picture. Identification is rendered easy by the endogenous spores of terminal chlamgdos-pods. It is freed, by the dry cultivation of the trichophytons, from contamination by bacteria and pus—cocci and an admirable method of studying the trichophytons is afforded.

The Treatment of Urticaria.—BALZER (*Rev. Intern. de Med. et Surg.,* April 255, 1903), has found a solution of menthol, thymol and carbolic acid useful as an application to the local manifestations of this troublesome disorder. As a rule, he uses them in a 2 per cent solution in either alcohol or aromatic vinegar, or sometimes he use the following combination: Acid thymic, 1 gm.; acid phenic, 2 gms.; alcohol, 90 per cent, 200 grs. In cases in which the disease is persistent, and where the action of these drugs is required for a longer time, he has combined the same in an ointment. This form of treatment is not designed to meet all forms of this disease and the local treatment often depends upon the cause, just the same as does the general treatment. In some cases of urticaria caused by contact with insects he has found that the application of ichthyol has proved useful. In the general management of these cases he gives the usual advice as to the careful regulation of the diet and also the care of the skin.

To Give Quinine.—BORDE (*Gaz. Hebd. des Sciences Med. de Bordeaux*), describes a method of disguising the taste of quinine by mixing 1 gram of quinine sulphate in a mortar with 8 grams of olive oil. A few drops of this mixture taken with a half teaspoonful of cold milk is swallowed without reluctance. The mouth will be left void of the bitter taste if the precaution is taken to give a swallow of liquid immediately after. Even if this precaution is not taken, there will remain but a slight bitterness, which vanishes quickly. This oily mixture can be swallowed alone very easily, since the unpleasant taste is slight and is obviated by a drink directly after. The oil envelops every particle of the quinine, which glides easily over the moist mucosa.

Summer Complaints of Children.—Dr. SAMUEL A. VISANSKA says, as a student of pediatrics, he takes great pleasure in presenting this subject, and while many will differ with me in what he shall have to say, still my sole object is to try, if possible, to lower the death-rate of infants and children. The heated term will soon be upon us, and, judging the future by the past, hundreds of children will be carried to their graves. What a great responsibility, then, rests on the physician, and if by an exchange of ideas we can come to a better understanding how to combat the disease, what a blessing it will be to all in the future! By summer complaints of children we mean gastroenteritis, enterocolitis, and colitis. He makes this division of the diseases as we usually see them. There have been and exist to-day so many theories as to the cause of summer complaints that time will not permit me to take them all up, but there is one theory above all others that I desire to see eliminated from the minds of every physician and layman—this is the teething theory. Being called to a little patient during the summer, the first question we ask the mother is: What seems to be the trouble with your baby? Nine times out of ten the answer is: The baby is teething and the bowels are "running off." Questioning the mother further: How long has the baby ben sick? Answer, four or five days. Have you called in another physician? No, the baby is just teething, and I thought it was natural for the bowels to run off. What have you given the child? Well, I gave it a dose of oil, and that did not seem to do any good; then I gave it calomel; then the good old grandmother came along with her grandmotherly advice; then one of my neighbors heard the baby was sick, said her baby once had the same trouble, so I tried her remedy, but it did not have the desired effect, so I had to call you in. Then we ask how many stools the child is passing; the answer is anywhere from twelve to twenty. Upon examination you find the child almost a skeleton, face pinched, eyes sunken, thirsty, restless, feverish and delirious. Such is the picture often presented to us at the bedside.

To my mind teething has absolutely nothing to do with diarrhea, and every modern text-book on pediatrics will agree with me. We forget that children born at a certain time will teethe during the winter; how many cases of winter diarrhea are you called to attend? Nearly all the diseases of childhood have been ascribed to teething, but there is no one who does not admit that some children have teeth without disturbance. In children of a nervous temperament we sometimes find them a little fretful or cross, and in the evening a slight rise of temperature. There is no treatment for teething, as it requires none. Even an increased flow of saliva should not be overlooked, and a stomatitis should be carefully treated. There is no intimate connection between healthy dentition and the flow of saliva. A child dies of teething and summer complaint, and little is thought of it. Let a child die of diphtheria, and the people throw up their hands in horror. The taking away is just the same.

In looking over the death record in Atlanta, I see several cases of death from teething reported, and I am only surprised that the Board of Health accepted such certificates. A diagnosis of heart failure would be far more scientific, yet the Board of Health will not accept such a diagnosis, and they are quite correct. As to the true causes, I attribute heat, low power of resistance, bad ventilation, overcrowding, improper diet, too much diet. Clinical experience teaches us that infants do not stand extremes of heat and cold. My opinion is that the extremes of either lower the power of resistance, and that bacteria do the rest.

In the short time allowed to this paper I will only be able to take up the principal points of treatment and not go into details. All cases of enterocolitis are not true cholera infantum, and Rotch has placed this disease where it belongs, under specific infections—diseases caused by a specific organism, and characterized by acute gastroenteric disturbance with intense choleriform symptoms. The term cholera infantum should be exclusively restricted to this class of cases, and should not be used to designate the many acute and serious attacks of vomiting and diarrhea which are so often designated cholera infantum. It is a rare disease, and Rotch is correct. Recently a serum has been discovered which is said to be almost a specific for this disease, and I trust it will soon be placed upon the market.

Being called to a case of enterocolitis, four things are to be considered: (1) To assist the effort which nature is making to free the stomach and intestine from the poison which is in them; (2) to restore the surface circulation, which is seriously interfered with; (3) to supply water to the tissues, which are being drained to so great an extent; (4) to support the strength until the disease has run its course. The poison seems to act with especial violence upon those portions of the economy where it is more complicated, namely, the stomach and intestines. We therefore have at first extreme irritation of these parts, which causes increased peristalsis, and later vasomotor paralysis, with great transudation of serum. This condition of the gastroenteric tract should be borne in mind during the whole course of our treatment. The condition of the mucous membrane is such that absorption of drugs does not take place readily, therefore great care should be used in their administration. In the acute stage the digestive functions fail to act, therefore food of any kind is "adding fuel to the fire." Not a drop of milk should be given. This prohibition of milk must be absolute, whether from the mother, wet-nurse, or bottle. You are dealing with a poison more deadly than arsenic.

The second thing to do is to remove as far as possible the poison in the alimentary canal. Taking a lesson from nature, the vomiting and purging are attempts to eliminate the harmful substances, but like other attempts on the part of nature are ineffectual and exhausting. Lavage of the stomach and intestine should be done at once. Delay is dangerous. The stomach can be washed with warm water containing a teaspoonful of common salt to the pint. After this organ has been thoroughly cleansed, three to five grains of calomel should be given dry on the tongue. If vomiting returns, repeat the irrigations. Of course the calomel is given for its antifermentative action, and in order to reach the small intestines, which are inaccessible by the process of irrigation. The bowels should be irrigated with warm water and Castile soap, not less than a gallon of warm water being used. A little later an injection of cool water containing thirty grains of tannic acid to the pint should be used. Some of the poisons formed are, as we all know, proteids which are precipitated by tannic acid; therefore the object of the tannic-acid irrigation is to render inert any soluble poisonous proteids which may remain in the intestines after the first washing. If the rectal temperature is very high, ice-cold water can be given by enemata. When the vomiting has continued for some time, and there is prostration with great thirst, the infant should be allowed to such sterilized ice-cold water from the bottle (to which a few drops of brandy have been added). If vomiting and diarrhea continues to be excessive, a hypodermic of morphine 1.100 grain, atropine 1.800 grain, should be given for an infant a year old. The effect should be carefully watched, and the dose repeated if necessary. To restore the circulation, or if there are signs of collapse, nothing is better than the hot pack. This should be given by wrapping the child to the chin in sheets wrung out of water at least as hot as 100.2°. It then should be enveloped in a hot blanket. This procedure should be repeated as often as necessary. While the infant is in the pack, water can be given freely by the mouth, and a subcutaneous injection of normal salt solution should be given. To keep up the heart's action, minute doses of strychnine, digitalis, and nitroglycerin are at time indicated. As the disease clears up a little sterile food should be given; the child should be kept outdoors as much as possible, fresh air being an important factor in all diarrheal disorders in summer.

Entercolitis.—The dietetic management and internal treatment are similar to that of the preceding disease. A dose of castor oil, then calomel, is to be promptly administered, and followed in a few hours by copious irrigations of the colon, preferably tepid saline solutions. Later a thin starch solution, to which a few minims of laudanum have been added, may be gently thrown into the rectum, to be repeated if necessary. For intestinal putrefaction nothing is better than salol and salicylate or subnitrate of bismuth, though every physician has his favorite prescription. Opiates should only be given when absolutely necessary.

Colitis.—In the treatment of colitis we have three things to combat—tenesmus, the passage of mucus and blood, and a great many stools. The diet should be easily digested food. Our object now is to relieve the straining, lessen the frequency and change the character of the stools. Nothing acts better than the following: Sulphate magnesia, grs. v; tr. opii deod., min. ss to j; syr. tolu, min. xv; aq. menth. pip. q. s. make 1 oz. M. Sig., a teaspoonful every two hours to a child one yea rold. The opium should be ordered separately, as you may want to increase or decrease the dose, or leave it out entirely. After a few doses you will get the desired effect; then large doses of bismuth subnitrate should be given, say, to a child one year old, a half drachm every two hours. Do not be afraid to give the bismuth; small doses are useless. High irrigation of the colon with normal salt solution should be given morning and evening, and an occasional dose of calomel and soda is often required. During convalescence tonics are indicated. A change to the mountain, country, or seashore will often prove beneficial.—*Therapeutic Gaz.*, 1903, p. 445.

PEDIATRICS

VOL. XV. DECEMBER, 1903 NO. 12

ORIGINAL ARTICLES

REPORT UPON THE RESULTS WITH DIFFERENT KINDS OF PURE AND IMPURE MILK IN INFANT FEEDING IN TENEMENT HOUSES AND INSTITUTIONS OF NEW YORK CITY: A CLINICAL AND BACTERIOLOGICAL STUDY.*

BY WM. H. PARK, M.D., AND L. EMMETT HOLT, M.D., OF NEW YORK.

The work, of which the following is a report is a part of an investigation into the production, transportation and feeding of cow's milk in New York City, which was undertaken in the summer of 1901, and which was extended over two years. The entire investigation contemplated an inquiry into the condition of farms such as were supplying milk to New York, the transportation of milk, its condition on delivery and its effect upon the children in tenement houses and institutions.

Observations upon the results of feeding cow's milk to healthy infants in tenement houses were determined upon, since in this way it was believed we could best study the problem under the conditions actually existing, and also avoid those influences met with in institutions which in themselves are so deleterious to in-

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[From the Rockefeller Institute for Medical Research and the Research Laboratory of the Department of Health, New York City.]

*Read before the Association of American Physicians, Washington D. C., May 12, 1903.

fants. For comparison, however, a number of institutions were carefully studied during the summer of 1901.

The purpose of this investigation was to gather some facts upon the following points: (1) To make a comparison of the results of infants feeding in tenements in winter and summer; (2) to determine how far such results were affected by the character of the milk used, especially its original bacterial contents, its preparation, and whether it was fed after heating or raw; (3) to see to what extent results were modified by other factors, such as the care the infants received and the surroundings in which they lived.

The clinical observations contained in this report were made by the following persons who were employed by the Rockefeller Institute: Drs. Eli Long, Mary E. Goodwin, Jane Berry, Alma Vedin, Mary Willets and Marie Grund. During the first season, J. S. Mabey was employed by the Institute, but during the second by Mr. Straus. There assisted in the work as volunteers, Drs. J. Sobel, Angenette Parry and Ford. Dr. Sobel reported for two seasons on a group of babies fed from the Good Samaritan Dispensary. To all of these workers the greatest credit is due for the thorough and conscientious way in which they did their work. They were most earnest and painstaking in obtaining as far as possible the facts desired, and much of the value of this report is due to their efforts. The bacteriological investigations were for the most part carried out in the Research Laboratory of the Health Department; but also, to a considerable extent, in the Carnegie Laboratory of the New York University. Drs. Letchworth Smith, Mary E. Goodwin, Katherine R. Collins and Rose A. Bebb carried out this portion of the work.

Observations were made during the summer of 1901, the winter of 1901-2, and the summer of 1902; during each of these seasons the different groups of infants were followed for an average period of about ten weeks. A considerable number were unavoidably lost sight of owing to removal with failure to leave address, and various other causes; but all others who could be kept under observation are included in this report. Excluding all imperfect records and those cases that were observed too short a time to admit of any deductions, there remain 632, of which 98 were observed during the summer of 1901; 211 in the winter of 1901-2; 278 in the summer of 1902, and 45 in the summer of 1903. This group of 45 is included although the observations were made after the general investigation had closed.

The plan of investigation was that each of the workers should have a group of children, never more than 50, under personal observation. So far as possible the children were kept under the same general conditions as before. The weights were taken with great care by the physicians, at regular intervals in most cases. Nearly all of the infants were observed in their homes, to which regular visits were made twice a week for the entire period. One group of about 50 was observed by Dr. Sobel at the Good Samaritan Dispersary to which mothers came daily for the milk for their infants. When necessary one of his assistants went to their homes. In all cases advice was given in regard to matters of hygiene and the general care of the children. It was customary to stop the milk temporarily, whenever acute disturbances of digestion existed.

Bacteriological Investigation of the Milk Used in Feeding.— The clinical work was carried on in conjunction with a bacteriological study of the milk used, in order to determine whether any relationship existed between the number and character of the micro-organisms in milk, and the amount of diarrheal disease in the children to whom it was fed. Bacterial counts were made once or twice a week from the milk as given to each child. Specimens being taken at times from the raw and at times from the heated milk.

The bacteria were isolated from the milk through plating in a two per cent. lactose-litmus-nutrient-gelatin, or agar, and later grown upon the usual identification media. The pathogenic properties of the different bacteria were tested by intraperitoneal and subcutaneous inoculation in guinea pigs with 2 c.c. of a forty-eight-hour broth culture, and by feeding young kittens for several days with 3 to 6 c.c. daily of a twenty-four-hour broth culture by means of a medicine dropper.

With the characteristics of the bacteria thus determined, they were then separated into classes following as nearly as possible the lines suggested in Chester's Manual of Determinative Bacteriology. Further attempt was then made to identify as many as possible of the varieties with those previously described, using the descriptions of Chester and Migula. With a great many this proved unsatisfactory or impossible because of the incomplete descriptions in literature, or the lack of all description.

The varieties isolated represent only the species presenting greatest number in the milk examined, for in no case was more than 0.01 c.c. of a milk, and in most highly contaminated milks, only 0.001 c.c. used in making a plate, and varieties which occurred in too small numbers to be present in this quantity would necessarily be missed. For the purpose of this article it is not considered desirable to burden the reader with the enumeration of the varieties of bacteria found in the different samples of milk and their characteristics. Only a brief summary of the results will be given.

From the milks altogether 239 varieties of bacteria were isolated and studied. These 239 varieties, having some cultural or other differences, were divided into the 31 classes, each class containing from 1 to 39 more or less closely related organisms.

As to the sources of bacteria found in milk, we made sufficient experiments to satisfy us that they came chiefly from outside the udder and milk ducts.

Bacteria were isolated from various materials which under certain conditions might be sources of contamination from the milk, and the cultures compared with those taken from milk. Thus there were obtained from 20 specimens of hay and grass, 31 varieties of bacteria; from 175 specimens of feces, manure and intestinal contents, 28 varieties; from 10 specimens of feed, 17 varieties. Of these 76 varieties there were 26 which resembled closely those from milk, viz., 11 from grass or hay; 26 from manure; 5 from feed.

During the investigation a number of varieties isolated from milk were shown to be identical with types commonly found in water.

From the facts quoted above and from many other observations made during the course of the work, it would seem that the term "milk bacteria" assumes a condition which does not exist in fact. The expression would seem to indicate that a few varieties, especially those derived in some way from the cow, are commonly found in milk, which forms having entered the milk while still in the udder, or after its withdrawal, are so well fitted to develop in milk that they overgrew all other varieties.

As a matter of fact, it was found that milk taken from a number of cows, in which almost no outside contamination had occurred, and plated immediately, contained, as a rule, very few bacteria, and these were streptococci, staphylococci and other varieties of bacteria not often found in milk sold in New York City; the temperature at which milk is kept being less suitable for them than for the bacteria which falls into the milk from dust, manure, etc. A number of specimens of fairly fresh market milk averaging 200,000 bacteria per c.c. were examined immediately, and again after twelve to twenty-four hours. In almost every test the three or four predominant varieties of the fresher milk remained as the predominant varieties after the period mentioned.

The above experiments seem to show that organisms which have gained a good percentage in the ordinary commercial milk at time of sale will be likely to hold the same relative place for as long a period as milk is ordinarily kept. After the bacteria pass the 10 or 20 million mark, a change occurs, since the increasing acidity inhabits the growth of some forms before it does that of others. Thus some varieties of the lactic acid bacteria can increase until the acidity is twice as great as that which inhabits the growth of streptococci. Before milk reaches the curdling point, the bacteria have usually reached over a billion to each c.c.. For the most part specimens of milk from different localities showed a difference in character of the bacteria present, in the same way that the bacteria from hay, feed, etc., varied. Even the intestinal contents of cows, the bacteriology of which might be expected to show common characteristics, contained beside the predominating colon types, other organisms which differed widely in different species and in different localities. Cleanliness in handling the milk and the temperature at which it had been kept were also found to have had a marked influence on the predominant varieties of bacteria present.

Pathogenic Properties of the Bacteria Isolated.—Intraperitoneal injection of 2 c.c. of broth or milk cultures of about 40 per cent. of the varieties tested, caused death. Cultures of most of the remainder produced no apparent deleterious effects even when injected in larger amounts. The filtrates of broth cultures of a number of varieties were tested, but only one was obtained in which poisonous products were abundantly present. Death in guinea pigs weighing 300 grams followed within fifteen minutes after an injection of 2 c.c.; 1 c.c. had little effect.

As bacteria in milk are swallowed and not injected under the skin, it seemed wise to test the effect of feeding them to very young animals. We therefore fed forty-eight hour cultures of 139 varieties of bacteria to kittens of two to ten days of age, by means of a glass tube. The kittens received 5 to 10 c.c. daily for from three to seven days. Only one culture produced illness or death. A full report on the identification of the varieties of bacteria met with in this investigation can be found in an article by Dr. Smith in the 1902 Annual Report of the Department of Health.

After two years of effort to discover some relation between special varieties of bacteria found in city milk and the health of children, the conclusion has been reached that neither through animal tests nor the isolation from milk of sick infants have we been able to establish such a relation. Pasteurized or "sterilized" milk is rarely kept in New York longer than thirty-six hours, so that varieties of bacteria which after long standing develop in such milk did not enter into our problem. The harmlessness of cultures given to healthy young kittens does not of course prove that they would be equally harmless in infants. Even if harmless in robust infants, they might be injurious when summer heat and previous disease had lowered the resistance and the digestive power of the subjects.

This failure to discover definite pathogenic bacteria, as well as the numerous varieties of bacteria met with, have forced us to rely on the clinical observation of infants to note what difference, if any, occurred in those fed on raw and Pasteurized milk from the same source, and upon different milks of unknown origin varying in the number of bacteria contained. In the following pages, observations upon food are combined with those upon other factors which influenced the health of the infants.

Selection of the Children for Observation.—The original aim was to include only infants who were entirely bottle-fed, but it was found that the great majority of all infants in the tenements receive during the first six months occasional breast feedings at night, and nearly all are given some solid food after they are six months old, or as soon as they are able to hold it in their hands. The purpose of the investigation being to obtain relative results with different forms of milk and not absolute results with one form it is believed that the conclusions reached are not affected by the fact that many of the infants received breast feeding at night. Indeed including such infants has the advantage of studying representatives of a very large class. In each season some infants who are entirely breast-fed were observed for purposes of comparison.

In selecting the children the only conditions made were that they should not be ill or suffering from marasmus when observations were begun, and that they should be of suitable age. Of the entire number 340 were six months old or under, 265 were from seven to twelve months; 47 were a little over twelve months. With the exceptions stated, every child available was included by the physicians until the proper number was made up. The district in which most of the children lived was the lower east side of New York, as densely populated as any part of Manhattan Island.

An unexpected difficulty was encountered in beginning the investigation in the scarcity of bottle-fed infants in the region where the families were selected. One of the physicians reported that in a densely populated neighborhood where every street was swarming with children, hardly half a dozen bottle-fed infants could be found on a block. While this may not have been true of the entire district, it was the observation of all the workers that the proportion of bottle-fed infants in tenement houses was surprisingly small. This is a very different impression from what one gains from visiting dispensaries where great numbers of bottle-fed infants are seen. But the dispensaries draw patients from very large districts and gather the cases that are not doing well, so that the aggregate seems very large. This excess in proportion of the bottle-fed infants at the dispensaries over that in the houses is in itself striking testimony to the advantages of breast feeding.

The Character of the Food Employed.—It was at first intended to make no change in the food the child was receiving, but it was found necessary in order that observations might also be made upon the comparative effects of heated and unheated milk in summer to place a number of infants upon a modified raw milk provided for them, which was a part of a larger supply distributed to others after Pasteurization. This was rendered all the more necessary since it was discovered that during the summer the sterilization of milk in some form was almost universally practiced in the tenements of New York. In the summer of 1902 especially, it was rare to find an infant fed upon raw milk; an incidental testimony to the value of the praiseworthy efforts of the Health Department, and the agitation in the public press in favor of clean milk and the necessity for sterilization in hot weather. When gastro-intestinal disturbances of any severity developed, the infants were deprived of milk for a day or two and put on barley water or other suitable food.

In the district where the observations were made the following forms of milk were extensively used: (1) Condensed milk; (2) milk purchased at small stores with groceries and other provisions and known as "store milk;" (3) bottled milk; (4) milk from central distributing stations, chiefly from the Straus milk depots and Good Samaritan Dispensary.

Condensed Milk.—That used was usually bought in cans, *i. e.*, the sweetened variety; seldom were the best brands purchased. It was generally prepared at each feeding by adding hot water which, in most cases, had been boiled.

Store Milk.—This is the poorest grade of milk sold in New York, but varies at the different stores. It is kept in large cans in the small stores and is sold to customers at an average price of four cents a quart. It averages about 3.75 per cent. of fat. It is customary for milk to be purchased twice a day and it is carried home and kept in pails or pitchers. In summer it is usually heated at once; if it curdles, it is considered to be unfit for use and is returned. During the hot days of the summer of 1901, it frequently happened that milk obtained from two or three consecutive stores would curdle. Heating is usually done in a saucepan and the temperature is raised to a point where the milk begins to "foam," seldom to a boiling point. In most cases it is kept upon ice. It is usually prepared for the infant at each time of feeding. The only modification practises is, in most cases, dilution with water or barley water, equal parts being as a rule given when infants are about three months old and continued until ten or eleven months when whole milk is given. The bacteriological examination made of this milk during the summer of 1901 showed it to contain from 4,000,000 to 200,000,000 micro-organisms, an average of about

20,000,000 per c.c. The form of heating employed killed, it was found, about 95 to 99 per cent. of the bacteria present. In the summer of 1902, owing partly to the cooler season, but chiefly to the new regulations of the Health Department regarding the care and sale of milk, the average was about 3,000,000 per c.c. During the winter the number of bacteria ranged from 100,000 to 5,000,000 bacteria per c.c., and averaged about 400,000 per c.c.

Bottled Milk.—The greater part of the bottled milk used in these tenements was handled by one of the largest dealers in the city. This milk was produced under conditions which were only fairly good. However, it was so well handled during transportation and delivery that it was nearly always in good condition when received by the consumer. This milk averaged about 500,000 bacteria per c.c. It was sold in covered jars at eight cents a quart. The same general plan of modification was practiced as with the store milk, and it was also in summer heated and usually in about the same way. As the people who purchased this were not so poor as those using store milk, they were more likely to use ice for keeping it.

Besides this bottled milk some special milk from the Walker-Gordon and Briarcliff Farms was furnished gratuitously to a limited number of cases for the sake of comparison but this was not widely enough used to admit of drawing conclusions sufficiently definite to be expressed in figures. This milk averaged about 10,000 bacteria per c.c.

Milk from Central Distribution Stations.—The greater part of this milk was supplied from the Straus Milk Depots of which there are a number scattered through the city, and from the diet kitchen of the Good Samaritan Dispensary, a small quantity from other diet kitchens. The milk used at these places was generally of excellent quality, usually from an "inspected" or "certified" farm, but it was mixed with poor cream. It was furnished gratis to those too poor to pay, and at a small charge, usually one cent a bottle, to others. This milk after the addition of cream averaged before Pasteurization, nearly 2,000,000 bacteria per c.c.; after Pasteurization, about 500 per c.c.; after boiling, about 5 per c.c.. It is supplied in small bottles, each one containing the quantity for a single feeding. The bottles are washed and sterilized at the central stations. The Straus milk was generally Pasteurized; that from the Good Samaritan Dispensary was boiled. With both some attempt at modification was made, three or four standard formulas being used. The common modification consisted in the dilution with boiled water, the addition of lime water, milk sugar, and, in some cases, cream also; or the dilution with barley water and the addition of cane sugar. Regarding the use of these formulas, the quantity for one feeding, and the number of feedings daily, directions were usually given by the physicians in attendance at the Central Stations. As the mothers came daily for their milk, some constant supervision of the cases was thus possible, and many minor disturbances of digestion no doubt controlled by a proper variation of the food.

Infant Foods.——It was a surprise that the proprietary foods were so little used in the tenements, the expense being apparently the chief reason. Although they were given to a number of children observed, they were seldom used for a long time, or as the sole diet, and certainly cut no figure in the results. We have therefore not classified these cases separately.

Breast Feeding.—As already stated, the great majority of infants reared in tenements are breast-fed, at least for the first six months. No effort was made to collect many observations upon these children, but a few were introduced for the sake of comparison. It was thought at first to make a separate division of the children who were breast-fed, as it was the impression of some of the physicians who followed the cases that a decided difference existed between those who were partly nursed, usually at night, and those entirely fed. However, the general figures when tabulated did not show any very marked difference. The results seem to have depended rather upon the character of the other food.

In estimating the results obtained by the different methods of feeding two things were considered; first, the gain or loss in weight, and secondly, the amount of digestive disturbance, particuuarly diarrhea, which occurred in the different groups of infants. The cases have been divided according to results in four groups: (1) Those which did well. In this group are included the infants who made a substantial and generally a regular gain in weight during the period of observation, this usually amounting to from two to five pounds for the ten or twelve weeks, and those that had no diarrhea worth mentioning—usually both conditions existed together. (2) Those which did fairly, including those in which some diarrheal disturbances was present but not of a serious nor prolonged character, and in which the weight was either stationary or the gain was slight. Both these generally went together. (3) Those which did badly, including those in which considerable digestive disturbances, usually diarrhea, was present, or in which there was a loss in weight; generally here also both factors existed. (4) The fatal cases.

The following tables show in a condensed form the results obtained with the different foods employed in winter and in summer.

TABLE I. FOOD AND RESULTS.—WINTER.

	Did well.	Did fairly.	Did badly.	Died.	Totals
Store milk	47	6	2	0	55
Condensed milk	39	5	2	2	48
Good bottled milk	51	13	1	3	68
Milk from Central Distributing Stations	35	20	4	0	59
Best bottled milk	5	0	1	0	6
Breast feeding	7	1	0	1	9
Totals, excluding cases counted twice	156	41	8	6	211

TABLE II. FOOD AND RESULTS.—SUMMER.

	Did well.	Did fairly.	Did badly.	Died.	Totals
Store milk	21	23	20	15	79
Condensed milk	22	20	14	14	70
Good bottled milk	37	23	29	9	98
Milk from Central Distributing Stations	84	33	24	4	145
Best bottled milk	9	3	0	0	12
Breast feeding	17	7	7	0	31
Totals, excluding cases counted twice	184	108	88	41	421

Season and Results.—Nothing could be more striking than the contrast between the results in winter and in summer. The general summary shows that of the 211 winter cases, 156 did well; 41 did fairly, 8 did badly and 6 died. In other words, what might be considered good results were shown in 93 per cent. of the cases, and bad results in only 7 per cent. Furthermore, in only one of the six deaths was the cause connected with the digestive tract.

Of the 421 summer cases, 184 did well, 108 did fairly, 88 did badly and 41 died. In other words good results were obtained in 69 per cent. of the cases and bad results in 31 per cent. while in nearly all of the fatal cases death was due to diarrheal diseases. It should be remembered that all the children both winter and summer had the advantage of some continuous intelligent oversight, usually one visit a week and often two being made by the physicians. This supervision contributed in no small degree to the results in both groups of cases.

The difference in results in the summers of 1901 and 1902 was not great; the percentage of bad results in 1901 being 37; in 1902, 35. This may have been due to the slightly cooler season of 1902, or the better general quality of the city's milk. The proportion of children on the different varieties of milk varied somewhat in the two years, so that a strict comparison is difficult.

The showing made by the winter cases is most gratifying and was indeed a surprise to all. So large a percentage of good results by all methods of feeding, and apparently so little difference between them was not expected. Artificial feeding in the tenements in winter would seem to be comparatively a simple problem.

To what shall we ascribe the great difference between summer and winter results? There seem to be many factors, but a con-

Month.	No. of Infants.	Food.	Deaths.
June	34	Breast milk	0
	25	Cows' milk	0
	38	Breast and cows' milk	0
	128*	Milk and barley food	0
	Total..225		
	Number of cases of diarrhea, 15; deaths, 0.		
July	32	Breast milk	0
	20	Cows' milk	3
	38	Breast and cows' milk	0
	124*	Milk and barley food	0
	Total..214		
	Cases of diarrhea, 38; total deaths, 3 (all bottle-fed).		
August	28	Breast milk	0
	18	Cows' milk	3
	32	Breast and cows' milk	4
	129*	Milk and barley food	2
	Total..207		
	Cases of diarrhea, 50; total deaths, 9.		

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*Those on milk and barley food were all over twelve months old.

sideration of the facts accumulated, indicate that heat is the primary factor and bacteria and their products a secondary one, except when the contamination is extreme or pathogenic organisms are present.

The effect of continued heat upon the health of infants is shown in the number of cases of diarrheal diseases and the number of deaths during the months of the summer of 1901 in an institution in the country near New York City, where a fairly pure milk was fed raw. During the winter and spring there was almost no diarrhea; with the warm weather of June it increased, reaching its highest point in August. The comparative results with the breast and bottle-fed infants are also evident.

Food and Results.—(1) Store Milk.—The largest number of bad results were seen, as was expected, with the cheap store milk, where not only was the milk poorer, but the care at home less. The winter observations upon this milk included 55 cases in about half of which some method of partial sterilization was employed: in the remainder it was given raw. Of these 55 infants, 47 did well; 6 did fairly; only 2 did badly and none died. Combining those who did well, and those who did fairly, we have what may be considered good results in 96 per cent. of the cases and bad results in only 4 per cent. There was little apparent difference in results between those taking raw and those taking heated milk.

Store milk was the food of 79 of the summer cases. Of these 21 did well; 23 did fairly; 20 did badly and 15 died; in other words, good results in 56 per cent. of the cases, and bad results in 44 per cent. In nearly all of these cases the milk was heated in some way before feeding; usually it was raised nearly to the boiling point. This had the effect, it was found, of killing about 99 per cent. of the micro-organisms present, but the milk still contained after such heating between 5,000 and 500,000 bacteria to the c.c. An interesting point of tolerance of such milk was noticed in many cases. A number of infants living in bad surroundings yet who received fairly good care, took only cheap store milk and yet remained well throughout the entire summer. During 1901 some of the store milk was very bad, averaging on hot days over 100,000,000 bacteria per c.c.

(2) Condensed Milk.—There were 48 winter observations upon infants taking condensed milk; 39 children did well, 5 did

fairly, 2 badly, and 2 died, *i.e.,* good results were seen in 92 per cent. and bad results in 8 per cent. of the cases.

There were 70 summer observations made upon infants taking condensed milk. Only 22 of these children did well, 20 did fairly, 14 badly, and 14 died; or 60 per cent. good results and 40 per cent. bad results.

The results with condensed milk can hardly be attributed to the bacteria, inasmuch as it was almost invariably prepared with boiled water and contained relatively a small number of microorganisms before heating. These children were often apparently in good condition until attacked with acute disease, when they offered but little resistance and seemed to succumb more quickly than any other class of patients. In one family three healthy infants, triplets, five months old, were taken sick on the same day with vomiting and diarrhea, one died within twenty-four hours, one within two days, and the third within a week. A bacteriological examination of the prepared milk remaining in one bottle showed nothing noteworthy.

(3) Bottled Milk.—The better results observed with bottled milk should not be put down as entirely due to the character of the food. The people who purchased it were seldom so poor as those buying store milk; they were usually more intelligent and probably more careful in handling the milk. Often they had ice.

There were 68 winter observations on children fed upon bottled milk; of these, 51 did well, 13 fairly, only 1 did badly, and 3 died. None of these deaths were due to intestinal disease. In other words, there were good results in 94 per cent. of the cases, and bad results in 6 per cent.

There were 98 summer observations upon infants fed on bottled milk; of these, 37 did well, 23 fairly, 29 did badly, and 9 died. In other words, 61 per cent. of good results and 39 per cent. bad results. In these quite a number received the milk raw, but as in the other observations, as soon as any illness occurred, some form of attempt at sterilization was almost variably practiced.

It is interesting to compare these results with those seen with store milk just above them in the table. The percentage mortality with the better grade of milk is only about one-half that seen with either condensed or store milk, and yet the large number of infants who did badly brings the proportion of bad results with bottled milk almost up to that with the two preceding varieties. It was noteworthy, however, that among infants included as doing badly there was on the average less sickness than among those fed on store milk. It would seem therefore that good bottled milk as now used, while much less dangerous to life than cheap store milk, is still, judging by this proportion of failures, rather unsuccessful as a method of feeding.

(4) Milk from Central Distributing Stations.—There were 59 winter observations upon these patients, of which 35 did well, 20 fairly, 4 did badly and none died. In other words, good results in 93 per cent. of cases and bad results in 7 per cent.

There was 145 summer observations upon infants fed in this way; of these 84 did well, 33 did fairly, 24 did badly, and 4 died. In other words, 81 per cent. of good results, and 19 per cent. bad results. In about one-half of these cases the milk was Pasteurized; in the remainder, with the exception of a group of 42 cases to be mentioned later, in which the milk was given raw, the milk was sterilized.

The great difference between these results and those obtained with the three forms of feeding already considered, deserves special attention. The original milk used at the stations was of good quality, but not much better than the bottled milk generally used; with both some form of sterilization was practiced. The difference in results is not explained by the difference in these two factors. There were others of importance which must be sought. A certain amount of constant supervision was exercised over these infants, as some one, usually the mother, came daily to the milk dispensary for the food. Changes could thus be readily made in the milk according to the child's condition. If symptoms of slight indigestion were present, the mother was instructed to dilute the milk; with more severe symptoms, milk was temporarily stopped, etc. This supervision seems to us of the greatest value and can hardly be secured so well in any other way. Again, a mother sufficiently interested in her baby to come or send daily several blocks for the milk is generally one who values what she receives and also the advice which goes with it. This food, obtained in separate bottles for each feeding, is generally regarded by the tenement population as not exactly milk but as something very special, and therefore entitled to much more consideration than any form of food which they could prepare themselves at home.

Another point of importance is that some systematic attempt at milk modification was made in the milk furnished from central stations. Although this could not be done as accurately as for a smaller number of patients, the results were certainly improved by it. Again what contributed, in no small degree to success with this plan of feeding, was that this milk was supplied in separate bottles for each feeding, that the quantity for one feeding was suitable for the child, and that only a proper number of feedings for the twenty-four hours was dispensed at one time. There was not, therefore, the temptation to overfeeding and too frequent feeding, which with other methods are so generally practiced. Finally, the bottles in which it was kept were always properly cleansed, and sterilized, since this was attended to at the central station.

(5) Best Bottled Milk.—This was furnished to 18 infants living in the tenements, to discover whether any perceptible difference existed between the results with this milk and the other varieties. While these observations are not numerous enough to admit of any generalizations, they indicate what was previously believed, that, with the cleanest milk from the best cared for cattle, the smallest number of bad results occurred.

There were 12 infants placed upon this milk in summer; of these 9 did well, 3 fairly, there were none who did badly and no deaths. There were 6 infants upon this milk in winter, of whom 5 did well and 1 did badly.

The difference between very bad, highly contaminated milk, like that purchased at some of the small stores previous to 1902 and the best bottled milk, was in some cases very striking. Protracted diarrhea in infants who were taking store milk was often immediately improved and in several cases promptly cured by simply substituting clean milk, after an interval of no milk, for the previous food. In some severe cases, however, no improvement followed the purer milk.

Age and Results.—In 17 cases the ages were not recorded. Of the summer cases 217 were infants under six months; 191 were between six and twelve months, and 47 were over twelve months. The comparative results for the different ages are shown in the following table.

TABLE III. AGE AND RESULTS—SUMMER.

Age	Did well. Per cent.	Did fairly. Per cent.	Did badly. Per cent.	Died. Per cent.
Under 6 months	52	16	19	13
7 to 12 months	34	32	26	8
Over 12 months	49	32	19	0

Of the winter cases 123 were infants under six months, and 74 from seven to twelve months; none was over twelve months.

TABLE IV. AGE AND RESULTS—WINTER.

Age	Did well. Per cent.	Did fairly. Per cent.	Did badly. Per cent.	Died. Per cent.
Under 6 months	74	21	0	5
7 to 12 months	70	20	10	0
Over 12 months	..	..	..	..

These figures indicate a considerable higher mortality in infants under six months, but a surprising large proportion of infants over this age who did badly. In summer, other factors than the milk used must be taken into account, one of the most important being the unwise giving of table food to infants over six months old, a practice which is almost universal in the tenement population. Giving fruits even to infants is also an important cause of illness. This was strikingly seen among the Italians. In this class of the population it was the opinion of some of the physicians who observed these cases, that the use of fruit, often unripe, stale or partly decayed, was the cause of more illness in infants and young children than the impure milk.

A separate study has been made of these cases which did badly, and the fatal cases, to determine any other factors beside the food and age which contributed to the results. An attempt was made to discover what sort of care these infants received, what their surroundings were, and whether the results in feeding were due to conditions or diseases entirely outside the digestive tract.

Cases Doing Badly.—There were 96 infants who did badly, *i.e.*, they lost weight during the period of observation and had more or less disease of the digestive tract. Eighty-eight of these were summer cases and 8 were winter cases. The previous condition of this group of infants does not throw any special light upon results. This is noted in 86 of the 96 cases. In 52 the previous condition was put down as "good," and in 30 as "not good." It should be remembered that no infants previously in bad condition were included in the observations. The proportion of "good" and "not good" is about the same as in the children taken as a whole.

Care.—In the 88 summer cases this was not stated in 14; 30 were reported as receiving good care, 20 as having fair care, while 24 were positively neglected. The importance of the care the children received, as affecting the results of infant feeding, cannot be expressed in figures. What is included here as neglect was often of the grossest kind. As for example, where a mother was away all day at work and the infant left in charge of some old man, or irresponsible child, and where the visitor found bottles dirty, nipples rolling about the floor, sour milk in the feeding bottles, etc. It was practically the unanimous opinion of the physicians who made the observations that intelligent care had more to do with the results of feeding than any other factor. Many individual instances were reported of infants living under the worst surroundings and whose food was a very inferior kind of milk, and yet if the mother was intelligent and the infant well cared for, it throve in spite of the unfavorable conditions. On the other hand if the infant had no proper care it made little difference how good the milk furnished might be, the results were usually bad. One case will serve as an illustration. An Italian child two months old who had an intelligent, careful mother, did well for the entire summer on store milk. The following winter the mother was ill for a long time, during which time the child ran down steadily in spite of the fact that it was older and the weather was cold.

Surroundings.—While surroundings had a distinct influence upon the results in feeding, they were decidedly of less importance than the care. Since all these infants lived in tenements none could be said to have good surroundings. They were fair in 40 of the summer cases; distinctly bad in 33; in 15 they were not noted. Of the 8 winter cases, 7 had fairly good surroundings. By bad surroundings are meant very crowded apartments, rear tenements or basements. Many infants living in such places were rarely taken into the open air. Where the mothers availed themselves of the opportunities offered for day excursions upon the water and such fresh air as even the crowded city afforded, a distinct improvement was seen in the condition of the children.

Diarrheal Diseases and Other Forms of Acute Illness.—The number of days of diarrhea indicates pretty well the nature of the symptoms from which these infants chiefly suffered. Of the 88 cases which did badly, only 3 had no diarrhea; 19 had diarrhea lasting from one to seven days; 19, diarrhea from eight to fourteen days; 47, diarrhea of more than two weeks' duration. Other complications were present in 11 cases: bronchitis in 5; pertussis in 2; otitis in 1, and pneumonia in 3 cases. Of the 8 winter cases which did badly, none had diarrhea, but 3 had other complications, viz., one had measles, one had bronchitis, and one pertussis.

Fatal Cases.—Of the 632 children observed, 47 or 7.5 per cent. died during the three months of observation. The mortality of the 211 winter cases was 2.8 per cent.; of the 421 summer cases, 11.3 per cent. Of infants under one year, neither in the age nor the previous conditions do we find any sufficient explanation of the fatal result. In the 47 observed who were over one year, no deaths occurred. The care which the fatal cases received is significant. Only 16 of the 47 infants who died received good care, and nineteen were recorded as positively neglected. In 21 of the cases the surroundings were bad. The causes of death in the fatal cases were as follows:

Disease.	Summer.	Winter.
Diarrheal diseases	32	1
Pneumonia	5	2
Tuberculosis	2	0
Rickets	1	0
Diphtheria	1	0
Marasmus	0	1
Accident	0	1
Unknown	0	1
	41	6

The winter case having diarrhea was fed upon good bottled milk sterilized, and had gastric as well as intestinal symptoms. The marasmus case was a child fed upon condensed milk. In only two of the winter deaths could the result be definitely connected with the feeding; while in summer this was true of 30 of the cases.

Heated Milk vs. Raw Milk for Infants.—During each of the summers of 1902 and 1903, a special lot of milk was modified at one of the Straus depots for a group of 50 infants, all of whom were under nine months of age, and distributed daily in the usual way. To one-half the infants the milk was given raw; to the other half, Pasteurized.

The modified milk was made from a fairly pure milk mixed with ordinary cream. The bacteria contained in the milk numbered on the average 45,000 per c.c., in the cream 30,000,000. The modified raw milk taken from the bottles in the morning, averaged 1,200,000 bacteria per c.c.; the Pasteurized, about 1,000; taken in the late afternoon of the same day, they had respectively about 20,000,000 and 50,000.

Twenty-one predominant varieties of bacteria were isolated from six specimens of this milk collected on different days. The varieties represented the types of bacteria frequently found in milk. The infants were selected during the first week in June, and at first all were placed on Pasteurized milk. The 50 infants which had been selected were now separated into two groups as nearly alike as possible. On June 15, the milk was distributed without heating to one-half the infants, the other half receiving as before the heated milk. In this way the infants in the two groups received milk of identically the same quality, except for the changes produced by heating to 165° F. for thirty minutes. The infants were observed carefully for three months and medical advice was given when necessary. When severe diarrhea occurred barley water was substituted for milk.

The first season's trial gave the following results. Within one week 20 of the 27 infants put on the raw milk suffered from moderate or severe diarrhea; while during the same time only 5 cases of moderate, and none of severe diarrhea occurred in those taking Pasteurized milk. Within one month 8 of the 27 had to be changed from raw back to heated milk, because of their continued illness; 7 or 25 per cent. did well all summer on raw milk. On the other hand of those receiving the Pasteurized milk, 75 per cent. remained well, or nearly so, all summer, while 25 per cent. had one or more attacks of severe diarrhea. There were no deaths in either group of cases.

During the second summer a similar test was made with 45 infants. Twenty-four were put on raw modified milk; 13 of these had serious diarrhea,. in 5 of whom it was so severe that they were put back upon heated milk; 10 took raw milk all summer without bad effects; 2 died, 1 from gross neglect on the part of the mother, the other from diarrhea. Of the 21 on Pasteurized milk, 5 had severe attacks of diarrhea, but all were kept on this milk except for short periods, when all food was omitted; 16 did well throughout the summer. One infant, markedly rachitic, died.

The outcome of these observations during the two summers are summarized in the following table:

Kind of Milk.	Number of infants.	Remained well for entire summer.	Number having severe or moderate diarrhea.	Average number days off milk during summer.	Average weekly gain in weight.	Average number days diarrhea.	Deaths.
Pasteurized milk, 1,000 to 50,000 bacteria per c.c...	41	31	10	3	4 oz.	3.9	1
Raw milk, 1,200,000 to 20,000,000 bacteria per c.c...	51*	17	34	5.5	3.5 oz.	11.5	2

Although the number of cases was not large, the results, almost identical during the two summers, indicate that even a fairly pure milk when given raw, in hot weather, causes illness in a much larger percentage of cases than the same milk given after Pasteurization. A considerable percentage of infants, however, do apparently quite as well on raw as on Pasteurized milk.

Observations Upon the Use of Feeding Raw and Heated Milk in Older Children.—The children over three years of age who receive unheated milk, containing at different times from 145,000 to 350,000,000 bacteria per c.c., showed almost no gastro-intestinal disturbances. The conditions at three institutions will serve as examples.

In the first of these an average grade of raw milk was used which, during the summer contained from 2,000,000 to 30,000,000 bacteria per c.c. This milk was stored in an ice-box until required. It was taken by the children unheated and yet no case of diarrhea of sufficient gravity to send for a physician occurred during the entire summer. This institution was an orphan asylum containing 650 children from three to fourteen years of age; viz., three to five years, 8; five to eight years, 162; eight to fourteen years, 390.

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*Thirteen of the 51 infants on raw milk were transferred before the end of the trial to Pasteurized milk because of serious illness. If these infants had been left on raw milk, it is believed by the writer that the comparative results would have been even more unfavorable to raw milk.

A second institution used an unheated but very pure milk which was obtained from its own farm. This milk averaged 50,000 bacteria per c.c. The inmates were 70 children of ages ranging from three to fourteen. In this institution not a single case of diarrheal disease of any importance occurred during the summer.

In a third institution an average grade of milk was used which was heated. This milk before heating contained 2,000,000 to 20,000,000 bacteria per c.c. The institution was an infant asylum in which there were 126 children between the ages of two and five years. There were no cases of diarrhea during the summer.

These clinical observations taken in connection with the bacteriological examination at the laboratory show that, although the milk may come from healthy cattle and clean farms, and be kept at a temperature not exceeding 60° F., a very great increase in the number of bacteria may occur. Furthermore, this may occur without the accumulation in the milk of sufficient poisonous products or living bacteria to cause appreciable injury in children over three years of age, even when such milk is consumed in considerable amount and for a period extending over several months. Milk kept at temperatures somewhat above 60° F. was not met with in our investigations, but the histories of epidemics of ptomaine poisoning teach that such milk may be very poisonous. It is also to be remembered that milk abounding in bacteria on account of its being carelessly handled is also always liable to contain pathogenic organisms derived from human or animal scources.

Results with Very Impure Milk Heated vs. Those with Pure or Average Milk Heated.—During the summer of 1901, we were able to observe a number of babies fed on milk grossly contaminated by bacteria. In 1902, a systematic oversight of all stores selling milk was instituted by the Health Department, so that the very worst milk was not offered for sale that summer.

The observations upon the impure milk of 1901 are of sufficient importance to be given in detail, although already mentioned in this report in the observations upon infants of both summers which were fed on "store milk." A group of over 150 infants was so divided that 20 per cent. were allowed to remain on the cheapest store milk which they were taking at the time. To

TABLE SHOWING THE RESULTS OF FEEDING DURING JULY AND AUGUST, OF 112 BOTTLE-FED INFANTS BETWEEN ONE AND TWO YEARS OF AGE WITH MILK FROM DIFFERENT SOURCES, AND THE NUMBER OF BACTERIA PRESENT IN THE MILK.

Character of milk.	Infants under one year.					Infants over one year.				
	Number of infants.	Average weekly gain.	Diarrhea.		Deaths.	Number of infants.	Average weekly gain.	Diarrhea.		Deaths.
			Mild.	Severe.				Mild.	Severe.	
(1) Pure milk boiled and modified at dispensary or stations; given out in small bottles. Milk before boiling averaged 20,000 bacteria per c.c.; after boiling 2 per c.c.	41	3 oz.	10	8	1*					
(2) Pure milk 24 hours old, sent in quart bottles to tenements, heated and modified at home, 20,000 to 200,000 bacteria per c.c. when delivered	23	4⅙ "	8	5	0	24	4½ oz.	8	2	0
(3) Ordinary milk 36 hours old, from a selected group of farms, kept cool in cans during transport; 1,000,000 to 25,000,000 bacteria per c.c., heated and modified at home home before using	18	4 "	6	6	1†	12	4 "	1	2	0
(4) Cheap milk, 36 to 60 hours old, from various farms, some fairly clean, some very dirty; 400,000 to 175,000,000 bacteria per c.c.	21	¼ "	4	13	4‡	7	⅓ "	1	3	0
(5) Condensed milk of different brands. Made up with hot water. As given, contained bacteria from 5,000 to 200,000 per c.c.	9	¼ "	5	2	3	4	3⅞ "	1	3	0
(6) Breast Milk.	16	2¼ "	5	2	0					

about the same number was given a pure bottled milk from Briarcliff Farms, sent to their homes free of charge by Mr. Walter W.

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*This infant died from enteritis and toxemia.

†This infant died of pneumonia. There had been no severe intestinal disorder noted.

‡One of the four had pertussis, the remaining three died from uncomplicated enteritis.

Law. A third group was fed on the same quality of milk as the second, but sterilized and modified at the Good Samaritan Dispensary. A fourth group received milk from an ordinary dairy farm. This milk was sent to a store in cans and called for by the people. A few infants fed on breast and condensed milk were observed for control.

In estimating the insignificance of the observations recorded in the tables, one should bear in mind that not only do different infants possess different degrees of resistance to disease, but that, try as hard as the physicians could, it was impossible to divide the infants into groups which secured equal care, and were subjected to exactly the same conditions. It was necessary to have the different groups in somewhat different parts of the city. It thus happened that the infants on the cheap store milk received less home care than the average, and that those on the pure bottled milk lived in the coolest portion of the city. Certain results were, however, so striking that their interpretation is fairly clear. It is to be noted that the number of infants included in each group is small.

There is nothing in the observations to show that fairly fresh milk from healthy cows, living under good hygienic conditions and containing, on some days, when delivered, as many as 200,000 bacteria per c.c., had any bacteria or any products due to bacteria that remained deleterious after the milk was heated too near the boiling point.

On the other hand it is possible that certain varieties of bacteria may, under conditions that are unsanitary, find entrance to milk and survive moderate heat or may develop poisonous products resistant to heat in sufficient amount to be harmful, even when they have accumulated to less than 200,000 per c.c.

Turning now to the results of feeding with milk which has been heated and which before sterilization contained from 1,000,000 to 25,000,000 bacteria per c.c., averaging about 15,000,000, though obtained from healthy cows living under fairly decent conditions and kept moderately cool in transit, we find a distinct increase in the amount of diarrheal disease. Though it is probable that the excessive amount of diarrhea in this group of children was due to bacterial changes which were not neutralized by heat or to living bacteria which were not killed, yet it is only fair to consider that the difference was not very great and that the infants of this group were under surroundings not quite as good as those on the purer milk.

Finally, we come in this comparison to the infants who received the cheap store milk Pasteurized. This milk had frequently to be returned because it curdled when boiled, and contained, according to the weather, from 4,000,000 to 200,000,000 bacteria per c.c. In these infants the worst results were seen. This is shown not only by the death rate, but by the amount and the severity of the diarrheal diseases, and the general appearance of the children as noted by the physicians. Although the average number of bacteria in the milk received by this group is higher than that received by the previous group, the difference in results between this group and the previous one can hardly be explained by the difference in the number of bacteria. The varieties of bacteria met with in this milk were more numerous than in the better milk, but we were unable to prove that they were more dangerous. Probably the higher temperature at which the milk was kept in transit and the longer interval between milking and its use allowed more toxic bacterial products to accumulate.

Observations Upon Milk Feeding in Institutions.—During the summer of 1901, observations were made by Dr. Long in nearly all the institutions for children situated in New York City. He found, with three exceptions, that no particular care was taken to secure a supply of pure milk. Samples taken from the supply of the other institutions showed that the milk averaged over 1,000,000 bacteria per c.c. when delivered, and at half of them it averaged over 10,000,000 per c.c. The cream frequently contained 60,000,000 bacteria per c.c. The milk at two places contained at times over 100,000,000. At several special hospitals for young children the milk and cream contained on different days from 26,000,000 to 157,000,000 bacteria per c.c. Formaldehyde was also occasionally found, especially in the cream. Samples of milk were taken weekly from most of the institutions and examined as to the number of bacteria and in some cases also as to the varieties present.

As a rule, to the children who were over three years old the milk was given raw, while for those under two years it was heated (sterilized). For those between two and three years, it was sometimes heated, sometimes not. In only two institutions was it possible to trace any epidemic of diarrhea among the infants and older children, and in these, the particulars of which are given below, the results cannot be reasonably attributed to the milk.

The first epidemic of diarrhea occurred at the New York Infant Asylum during June and July, 1901. There were in the institution 86 infants; 30 of these were bottle-fed and 56 were on breast milk. Of the 30 bottle-fed infants, 22 suffered from diarrhea. Of the 56 breast-fed infants, only 7 were affected. The epidemic was mild in character, only 2 infants dying.

This epidemic, which occurred during and after a period of very hot weather, at first glance might be ascribed to the milk. The fact, however, that 7 cases occurred among the breast-fed infants, that the cases occurred from time to time, not simultaneously, and that the milk used had been previously heated, points rather to an infection communicated from the sick to the well than to one conveyed by the milk, unless it was true that the milk had been contaminated in the wards.

In another institution an epidemic of moderately severe diarrhea occurred during the winter, in which at first all the cases came from one ward, and then later from a second ward. In this epidemic, infection through the milk was not conceivable, since the bottle-fed infants in the wards where no illness occurred, received milk from the general supply.

General Conclusions.—In addition to the statistical reports of their observations, the different physicians who watched the infants in their homes were asked to state their own conclusions regarding the general problem of infant-feeding in the tenements. These general impressions are most suggestive and cannot fail to be of interest to all who are working at this difficult problem.

It was practically the unanimous opinion that the most importnat factor in securing good results is intelligent care. This covers much: clean bottles and nipples; the willingness and ability to carry out directions as to methods of feeding, quantities, frequency, the stopping of milk at the first signs of serious diarrhea, etc.; proper care of the milk itself while in the house, and methods of sterilizing; suitable clothing and cleanliness of the children, and as much fresh air as possible.

Most of the physicians stated that, leaving out the very worst store milk in summer, the results were much less affected by the character of the milk than they had anticipated, and distinctly less than by the sort of care the infants received.

The surroundings alone had much less influence on results than was anticipated. For not only were breast-fed infants found doing well under the most unfavorable surroundings, but those also who received only the bottle as a rule did well, provided they received intelligent care and good milk.

The depressing effects of great atmospheric heat, *i. e.,* a temperature in the neighborhood of 90° F., or over, were very marked in all infants no matter what their food. Those who were ill were almost invariably made worse, and many who were previously well became ill. A bad method of feeding, or rather a feeding without any method, was responsible for many failures when the milk itself was of good quality. Common mistakes were, feeding an infant every time it cried; giving it a full bottle no matter what the age of the child, and letting it take as much as it would; preparing a large bottle of food at one time, and warming it over from time to time until the child had taken the whole of it, or allowing the milk to turn sour in the feeding bottle. Quantities proper for single feedings were almost invariably disregarded. Proper washing of feeding bottles was seldom seen in a tenement house. Such matters as these are closely connected with intelligent care, which has been already considered.

The importance of the matters just mentioned, raises the question of how much can be accomplished by the distribution of printed slips of directions. It was the observation of the physicians that comparatively little can be accomplished by these alone. Such printed circulars are often treated by the tenement-house mother very much as most of us treat the printed advertisements which are left at our doors—seldom read and soon thrown away. Mothers are often anxious and willing, but ignorant and stupid. Many cannot read and many more have not the wit to apply in practice what they read. When however, such printed advice was preceded or accompanied by personal explanation, it was found of great assistance. Personal contact is the only sure way to influence these people, and this must be frequently repeated to influence them permanently; as an aid to this, printed slips are useful. Printed directions, however, should be as simple as possible in statement, few in number, and touch only the most vital matters, telling the mother always what she is to do, not what she is not to do.

Summary.—The observations here recorded were made upon the groups of infants for periods of about three months only, and the conclusions drawn relate especially to the more immediate effects of the milk.

1. During cool weather neither the mortality nor the health of the infants observed in the investigation, was appreciably affected by the kind of milk or by the number of bacteria which it contained. The different grades of milk varied much less in the amount of bacteria contamination in winter than in summer, the store milk averaging only about 750,000 bacteria per c.c.

2. During hot weather when the resistance of the children was lowered, the kind of milk taken influenced both the amount of illness and the mortality; those who took condensed milk and cheap store milk did the worst, and those who received breast milk, pure bottled milk, and modified milk did the best. The effect of bacterial contamination was very marked when the milk was taken without previous heating; but, unless the contamination was very excessive, only slight when heating was employed shortly before feeding.

3. The number of bacteria which may accumulate before milk becomes noticeably harmful to the average infant in summer, differs with the nature of the bacteria present, the age of the milk, and the temperature at which it has been kept. When milk is taken raw, the fewer the bacteria present the better are the results. Of the usual varieties, over 1,000,000 bacteria per c.c. are certainly deleterious to the average infant. However, many infants take such milk without apparently harmful results. Heat above 170° F. (77° C.) not only destroys most of the bacteria present, but, apparently, some of their poisonous products. No harm from the bacteria previously existing in recently heated milk was noticed in these observations unless they had amounted to many millions, but in such numbers they were decidedly deleterious.

4. When milk of average quality was fed sterilized and raw, those infants who received milk previously heated did, on the average, much better in warm weather than those who received it raw. The difference was so quickly manifest and so marked that

there could be no mistaking the meaning of the results. The bacterial content of the milk used in the test was somewhat less than in the average milk of the city.

5. No special varieties of bacteria were found in unheated milk which seemed to have any special importance in relation to the summer diarrheas of children. The number of varieties was very great, and the kinds of bacteria differed according to the locality from which the milk came. None of the 139 varieties selected as most distinct amoug those obtained, injured very young kittens when fed in pure cultures. A few cases of acute indigestion were seen immediately following the use of Pasteurized milk more than thirty-six hours old. Samples of such milk were found to contain more than 100,000,000 bacteria per c.c., mostly spore-bearing varieties. The deleterious effects, though striking, were not serious nor lasting. At the present time there is in New York City, no general sale from stores of "Pasteurized" or "sterilized" milk, so that it is here very rare for such milk to be used thirty-six hours after heating.

6. After the first twelve months of life, infants are less and less affected by the bacteria in milk derived from healthy cattle. According to these observations, when the milk had been kept cool, the bacteria did not appear to injure the children over three years of age, at any season of the year, unless in very great excess.

7. Since a large part of the tenement population must purchase its milk from small dealers, at a low price, everything possible should be done by Health Boards to improve the character of the general milk supply of cities by enforcing proper legal restrictions regarding its transportation, delivery, and sale. Sufficient improvements in this respect are entirely feasible in every large city to secure to all a milk which will be wholesome after heating. The general practice of heating milk which has now become a custom among the tenement population of New York is undoubtedly a large factor in the lessened infant mortality during the hot months.

8. Of the methods of feeding now in vogue that by milk from central distributing stations unquestionably possesses the most advantages, in that it secures some constant oversight of the child, and since it furnishes the food in such a form that it leaves the mother least to do, it gives her the smallest opportunity of

going wrong. This method of feeding is one which deserves to be much more extensively employed, and might, in the absence of private philanthropy, wisely be undertaken by municipalities and continued for the four months from May 15 to September 15.

9. The use, for infants, of milk delivered in sealed bottles, should be encouraged whenever this is possible, and its advantages duly explained. Only the purest milk should be taken raw, especially in summer.

10. Since what is needed most is intelligent care, all possible means should be employed to educate mothers and those caring for infants in proper methods of doing this. This, it is believed, can most effectively be done by the visits of properly qualified trained nurses or women physicians to the homes supplemented by the use of printed directions.

11. Bad surroundings, though contributing to bad results in feeding are not the chief factor. It is not, therefore, merely by better housing of the poor in large cities that we will see a great reduction in infant mortality.

12. The observations indicate that close percentage modification of milk, although desirable in difficult cases, is not necessary to obtain excellent results with the great majority of infants, and that a certain adjustment of a healthy infant to its food is usually soon secured.

13 While it is true that even in the tenements the results with the best bottle-feeding are nearly as good as average breast-feeding, it is also true that most of the bottle-feeding is at present very badly done so that as a rule immense superiority of breast-feeding obtains. This should, therefore, be encouraged by every means, and not discontinued without good and sufficient reasons. The time and money required for artificial feeding, if expended by the tenement mother to secure better food and more rest for herself, would often enable her to continue nursing with advantage to her child.

14. The injurious effects of table food to infants under a year old, and of fruits to all infants and young children in cities, in hot weather should be much more generally appreciated.

ON APPETITE JUICE AND THE ETHICS OF EATING.

By J. G. Adami, M.A., M.D.

Neat napery, food so served that its very look attracts, surroundings such that the mind is diverted for the nonce from the cares of the every day world,—cheer that, however simple, is before all things inviting,—this is the epitomized philosophy of Professor Pawlow,* of St. Petersburg, and by this philosophy would he teach us to exorcise the demon of dyspepsia. "Now, good digestion wait on appetite and health on both," he would say, had he known his Shakespeare, for what he insists upon is that good health depends upon good digestion and good digestion depends essentially upon appetite so that, for the preservation of health, appetite is to be cultivated. And upon appetite he has much to say.

His philosophy, let it be confessed, smacks of the epicurean. In these days of stress and strain, we are apt in the rush and turmoil of things, to make a virtue of necessity and taking no thought of what we eat or what we drink, impute this unto ourselves for righteousness. Far from emprelatising our entrails we are apt to glory in our neglect of creature needs. Whether we be strenuous or but merely neurotic, we are impatient that the flesh should and must obtrude; that it must obtrude is, we are inclined to hold, beneath our dignity as Men and Women. On the other hand, says Pawlow—we render his doctrine broadly:—"Take no thought for your food" is sound advice to those leading right and natural lives. The exercise of regular bodily labour and an out-of-doors existence, with an equable mind and a brain not overworked, conduce to hunger, and hunger is the best sauce. A genuinely hungry man can triumph over the matutinal hot roll and can accomplish the boarding house steak without serious after affects. An indoor existence, on the contrary, with little exercise and with food eaten as a matter of a routine rather than in answer to the calls of hunger, and then with the mind occupied, not with the fare, but with the concerns of business, tends inevitably to dyspepsia. Under

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*Pronounced, by-the-way, Pavloff, the *a* as in "far."

these conditions health can only be preserved if thought be taken of the food and if appetite be stimulated. And he proves this by a remarkable series of experiments.

Twenty years ago Pawlow was already embarked upon his studies on digestion. It is, I am almost shocked to think, verging upon that number of years since it was my good fortune to be a fellow worker with him at Breslau under the late Professor Heidenhain, in his time the foremost investigator upon secretion and the work of the digestive organs. Heidenhain was a mastermind and upon him Pawlow has built. Even then he was a marked man, serious, earnest, and quietly enthusiastic. Oddly, my most vivid memory of him is dietetic, for in their kindness towards the new comer in the laboratory, he and Madame Pawlow invited me to their celebration of old New Year's Eve, introducing me then to the Samovar and to Russian tea taken flavoured with rum and a slice of lemon,—a most delectable beverage on a winter's night, and the Silesian winter resembles the Canadian. But a few years later he was appointed Professor of Physiology in the Imperial Military Academy of St. Petersburg, and later was given, in addition, the directorship of the physiological department of the Institute for Experimental Medicine, an institute founded, magnificently appointed and endowed by Prince Alexander of Oldenburg, and there he possesses what is in every respect a model research laboratory. Steadily and without remission Pawlow has continued his studies upon the digestive system and, as the work has developed, he has attracted to himself a band of capable assistants—Chigin, Hanicke, Katschowski, Kuwschinski,Kudreweski, Lobassow, Mdme. Shumow-Simanowski, Rjasanzew, Sokolow, Ssamoilow, Damiskan, Schepowalnikow, Wolkowitsch, Walther, Soborow, and a dozen others—who, under his direction, have undertaken an ordered succession of studies upon the different portions of the alimentary tract and its associated glandular organisms. The power that he has manifested to keep to one subject over this long period of time and of directing those under him in such a way that, without haste and without waste, the whole ground is gradually being covered, is remarkable. Remembering the similar year-long series of studies upon phagocytosis by Metchnikoff and his pupils, one wonders whether here we encounter a national Russion characteristic.

While through these investigations Pawlow's fame as a physiologist has been steadily increased, it has to be admitted that the medical world is only beginning to recognize as it ought the great value of his work. In part, no doubt, this is due to the language in which many of the most important papers have been published; the Russian language is, for very many reasons, outside the pale. In part, however, it must be acknowledged, as physiology is becoming more and more specialised, that, as a body,—of course there are exceptions—physiologists nowadays pursue their science for science sake, without regard to its bearing as a branch of medical study, and as a result not one practitioner in a thousand subscribes to, or keeps himself posted regarding the contents of, the physiological journals. The greater number of the articles contained in these journals have little or no direct bearing upon the problems which immediately interest the ordinary medical man.

But Pawlow has throughout recognized the importance of his researches from a medical standpoint and, in 1897, he gave in St. Petersburg a series of lectures to medical men in which be brought together in a simple and entertaining form the outcome of the investigations made by him and his pupils. In 1902 he gave other lectures bringing the account of his work up to date. Translated into French and German, these lectures have had an immediate success. Now it is possible to read them in our own language, retranslated from the German by Professor Thompson, of Dublin.*

It is only a small book of less than 200 pages, but of these not a single one is uninteresting. So important is the work, so full of fact and thought and suggestion, that it should be in the hands not only of every specialist upon digestive disorders, but of every physician. There has been nothing so valuable, nothing so fundamental upon the subject since Beaumont published his studies upon Alexis St. Martin. Upon these researches must be based the dietetics of the future.

Simply as a study in the experimental surgery of the digestive tract the work is of importance. As a primary requisite for exact enquiry into the work of the different organs, is was essential to elaborate a technique whereby each gland or collection of glands could be isolated and its secretion obtained in a pure state over long periods of time and under varying conditions of experiment. It is unnecessary here to tell of the means whereby Pawlow and his co-workers successfully accomplished this in case after case; as an indication of the triumph over operative difficulties it may be stated that dogs have been kept for months in good health with the pancreatic duct opening upon the abdominal wall, that it has been found possible to keep dogs in relative health for many weeks when one vagus nerve after the other has been cut in the lower cervical region (thus cutting off the vagus innervation of the abdominal viscera), and that accessory stomachs have been moulded from the main organ, separated wholly from this as regards their contents while remaining still in vascular and nervous connection with the same. Such miniature stomachs secrete their juice *pari passu* with the main organ, so that samples of gastric juice secreted under different conditions are to be obtained and analysed free from admixture with the food undergoing digestion in the latter.

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*The work of the Digestive Glands. Lectures by Professor J. P. Pawlow, translated into English by W. H. Thompson, M.D., King's Professor of the Institutes of Medicine, Trinity College, Dublin. London: Charles Griffin & Co., Limited. Philadelphia: J. B. Lippincott Company, 1902.

With this perfected technique singularly accurate and constant results have been obtained. I shall not attempt to epitomize by any means all of them. Returning to my main thesis, I would take up the one subject of "appetite juice."

That there is a salivary appetite juice, is a well known and universal experience, the mouth watering in anticipation of food. That there is similar gastric and even pancreatic juice has not previously been accepted. If seen by experimenters, as for instance by those well known old observers, Bidder and Schmidt, it was noted to be inconstant; the laws governing the flow were neither suspected nor determined.

Employing œsophagotomised dogs, with gastric fistulæ and accessory stomachs, Pawlow has been able to show that several factors are at work determining the extent to which gastric juice is poured out in the act of digestion.

Take an œsophagotomised dog and mechanically irritate the mucous membrane of the mouth and throat, or feed it with smooth stones, the stones dropping out of the upper end of the œsophagus as soon as they are swallowed, and under these conditions, the stomach remains dry, not a drop of juice is excreted. Obviously the mere mechanical act of eating or of irritation of the throat does not reflexly induce an outflow of the gastric juice.

Make a gastric fistula in this dog and let it be hungry, with an empty stomach: not a drop of juice is present in the viscus; the mucosa is dry. This, it may be noted, was Beaumont's experience in the case of his French-Canadian voyageur. Nor does mechanical irritation, as with a feather, or even distention of the organ by means of a collapsible rubber ball lead to any secretion. The mere presence of matter filling the organ does not in itself excite the outflow of the gastric juice.

Take the same dog in a fairly hungry condition and begin to prepare and chop up meat before it in such a way that it does not imagine that it is being hoaxed, but anticipates the meal, then, in *five minutes'* time, there starts a rapid and relatively abundant flow of gastric juice.

Or give the œsophagotomised dog raw meat; it gulps it down voraciously and, although never a particle reaches the stomach, five minutes again from the beginning of the meal there is a copious secretion of gastric juice, and this continues so long as the process of feeding is kept up.

In place of raw, give boiled meat; and the flow is not so extensive. If the animal has been fed only a few hours previously the flow may be slight. In short the amount of flow differs with different animals according to their state of hunger, according to the nature of the food, and according to personal idiosyncrasy. Some dogs have a stronger flow of juice, rich in pepsin, with raw meat than they have with bread, the meat is the more attractive. Others prefer bread to meat and, with it, have the more active secretion; some are phlegmatic and under all conditions give little of this appetite juice; others are sanguine and have generally an active flow.

Now, as a further exercise, take a dog having a gastric fistula and while it is asleep or while being awake, its attention is diverted, cautiously introduce into the stomach some pounded up raw flesh. Five, ten, fifteen, twenty minutes elapse and there is absolutely not a drop of juice discharged. It may be even an hour before there is any sign of secretion. More usually it begins in from twenty to thirty minutes. And here a long series of observations upon different food stuffs in animals with miniature stomachs and gastric fistulæ have proved that the different food stuffs act very differently as *direct* excitants of the gastric secretion. The results, in fact, are largely unexpected. Simple proteids like white of egg or like meat that has been boiled for days to remove all extractive matters, are wholly inert. They may lie in the stomach for hours (when directly introduced) without there being any outflow. Starches are likewise inert. Sodium bicarbonate and common salt are found, contrary to all previous teaching, when given with other substances, to lessen the outflow. Fats also have an inhibitory effect, but water in fair quantities directly incites a flow and so do meat broths and various extracts of meat.

We have, that is, to deal with two tides of secretion of the gastric juice; the psychic tide, set up by the sight of food, by the taste of the same, and by hunger, and the juice of this tide—the appetite juice—is relatively abundant, flows for a considerable period, and has strong digestive powers. And secondly, the chemical tide, set up at a later period by the direct effect of the food stuffs upon the gastric mucous membrane. The former is brought into activity by the higher centres. Cut through the vagus nerves and it is wholly stopped. The latter has also, according to Pawlow, a nervous origin being brought about by the simple reflex from irritation or chemical stimulation of the gastric mucosa. Taking everything into consideration, the former tide, of "appetite juice," is by far the more important. I may here quote one of Pawlow's own experiments amply proving this statement.

"I carried out the following procedures upon two dogs both of which had ordinary gastric fistulæ and were besides œsophagotomized. Into the stomach of the one, while its attention was distracted by patting and speaking kindly to it in order to avoid arousing any thoughts of feeding, a definite number of pieces of flesh were introduced through the fistula. The morsels were threaded on a string, the free end of which was fastened to the fistular cannula by inserting a cork. The dog was then brought into a separate room and left to itself. A like number of pieces was introduced into the stomach of the other dog in the same way, but during the process, a vigorous sham feeding was kept up, the animal being afterwards left alone. Each dog received 100 grms. of flesh. Since then an hour and a half has elapsed, and now we may draw the pieces of flesh out by means of the thread and weigh them. The loss of weight, and consequently the amount of flesh digested, is very different in the two cases. In that of the dog without sham feeding, the loss of weight amounts to merely 6 grms., while the flesh withdrawn from the stomach of the other dog weighs only 70 grms., that is to say, has been reduced by 30 grms. This, therefore, represents the digestive value of the passage of food through the mouth, the value of an eager desire for food; the value of an appetite."

"A good appetite in eating is equivalent from the outset to a vigorous secretion of the strongest juice; where there is no appetite this juice is also absent. To restore appetite to a man means to secure him a large stock of gastric juice wherewith to begin the digestion of the meal."

The morals are many which we may draw from this striking series of experiments. First and foremost, we have to learn that, in dieting either the well or the ill, the absolute quantity of the food stuffs we give and the number of calories these quantities represent, is far from being everything. A simple food stuff like white of egg, if given alone, will take a long time for its digestion, whereas a simple broth or extract of meat, whose direct value as a food is absolutely nil, may be of distinct value in directly stimulating the flow of the gastric juice and thus aiding the digestion of food stuffs which follow. Plain undiluted water has a like effect. Food eaten without relish and without appetite, although in itself most nutritious, may lie for hours within the stomach undigested. So again, food eaten while the mind is diverted to other things, may stay for long unacted upon, nay more, under such conditions, is liable to undergo decomposition and, irritating the mocous membrane, may lower its condition. Here, in short, appears to be the basis of the dyspepsia so common here as to be *the* American disease. I do not mean to say that bad cooking, iced drinks and creams, hot rolls, and so on, do not play their part, but even granting all these things, if we are to accept the abundant experiments of Pawlow and his co-workers, the conditions under which the food is eaten are the main causes of the disorder. "The old and empirical requirement that food should be eaten with interest and enjoyment is the most imperatively emphasized and strengthened of all." And if dyspepsia is to be warded off, the food should be taken under such conditions that everything is directed on the one hand to remove the thoughts from the cares of daily life and, on the other hand, to make the repast appetising so that the palate may be tickled and the flow of appetite juice excited. No matter how good the food, if presented, as is too often the case in our hotels, our public institutions, our hospitals and even in our homes, in an unattractive form, then, the appetite is not awakened, the appetite juice flows but poorly, and the digestive process is delayed to the detriment of the organism and of the individual, and of his mental and moral tone.

There is thus a philosophical basis for the customs of the table and for the decent carrying forward of the meal. Even, as Pawlow indicates, a good word has to be said for the preliminary cocktail, or glass of sherry and bitters. For, where food has to be taken and the individual is not absolutely anhungered, the bitters act as stimulating the appetite, that is, as preparing the organism to be attracted by food. Wholly apart from the question of the food value of alcohol, he is apt to consider that, at times, a little wine with the meal is a benefit in that it produces a mild narcosis of the highest centres and so distracts the mind from its cares while not acting upon the higher centres of the second order which determines appetite. The *hors d'oeuvre,* it is to be noted, formed of highly seasoned fish or fish paste or the like, and rich in extractives, both stimulates the appetite and has a direct affect upon the gastric mucosa. Soup again, having a basis of stock or meat broth, comes well at the beginning of the meal in that the extractives it contains and the water directly stimulate the flow of the gastric juice and so prepare the stomach for the more solid foods that follow. While "the repast begun with pleasure consequent upon the pressing need for food, must also, notwithstanding the stilling of hunger, be terminated with an agreeable sensation. At the same time the digestive canal must not be burdened with work at this stage. It is only the gustatory nerves which should be agreeably excited; hence the logic of ending with something sweet."

It must ever be kept in mind that "what is meat for one is poison for another," that the same diet, found nutritious for one, is eminently unlikely to be serviceable for every individual, but that, on the contrary, in dieting, the personal equation must be carefully studied and those dishes be given which the patient enjoys, even if the food value, as reckoned outside the body, of some of the ingredients, be far from approaching that of the constituents of other foods for which the patient has no appetite. And, remembering what has already been said concerning the pouring out of appetite juice, it is clear that if we wish to feed up a patient with a weak digestion, it is better not to give large meals but smaller meals at shorter intervals, for, with each meal, the flow of appetite juice is called into activity.

But for other points here touched upon and their explanation, reference has to be made to Pawlow's own work. There is one matter which I do not see touched upon by Professor Pawlow, namely, how far we are justified in drawing deductions from these experiments upon the dog regarding what occurs in man. If, as Pawlow puts it, this flow of appetite juice is brought about primarily by the intervention of higher functions such as judgment, will, desire, and if, by the establishment of this passionate desire for eating, unerring and untiring nature has linked the seeking and finding of food with the commencement of the work of digestion, then it has to be realized that the desire for special forms of food in a carnivorous animal must differ from the desire and choice of an omnivorous animal. So that, while flesh, more particularly, excites the dog, it may be that bread and other starchy foods and even sweet stuffs have in man an even stronger stimulating affect. To this extent we must be prepared to find differences in details in the working of the human as compared with the canine stomach.

Can we go any further? I think it will have to be admitted that we can, and that there are other differences between the flow in man and in the dog. I have just, as a matter of interest, been reading that which was the first great American contribution to medical science, William Beaumont's "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," of which the first edition, which, along with the second, we are fortunate in having in our library at McGill, was printed in "Plattsburgh" in 1833. You all know the main points of the story of the French Canadian, Alexis St. Martin, how in his youth he was accidentally shot through the body, leaving a permanent gastric fistula which, nevertheless, caused him so little eventual serious disturbance that he lived to be eighty-one, and you know how, on and off for many years, Beaumont, the army surgeon, made observations upon him. If you wish to refresh your memories as to the details of this most interesting history, I need but refer to Dr. Osler's paper in the Journal of the American Medical Association of November the 15th, 1902.

Reading the original, one is immediately struck with a very marked difference between Pawlow's results upon the dog and Beaumont's upon St. Martin. You will remember that the former found that mere mechanical stimulation of the gastric mucosa did not, in itself, call forth any flow of the gastric juice. Beaumont, on the contrary, employed this method of mechanical stimulation as a routine practice in order to obtain the pure juice. His method of gaining such juice, indeed, was simply the introduction of a gum elastic tube of the size of a large quill through the fistula into the stomach. "In health," he says, "and when free from food the stomach is usually entirely empty and contracted upon itself. On introducing a tube, the fluid soon begins to flow, first in drops then in an interrupted, and sometimes in a short continuous stream. Moving the tube up and down, or backwards and forwards, increases the discharge." Now this conclusion was not reached as the result of an occasional observation. There are, I have counted, some three score observations detailed in which studies were made with juice so gained from the fasting stomach. Nor was it a mere watery mucoid discharge that was gained by this means; it was a typical gastric juice, capable of acting upon various meats, milk, white of egg, and a host of other substances; it was strong enough to act upon bone; it was analyzed and hydrochloric acid was found present. It is true that ten, fifteen, or more minutes were necessary to collect even one and a half ounces of juice by this mode of irritation of the healthy, fasting stomach, so that the flow so induced was not found very active, true also that, occasionally no fluid was obtained by this means. But Beaumont suggests, what is at least a reasonable explanation, namely, that the irritation so induced is localised and not general, so the amount of secretion was not great. As Beaumont calls to mind, Spallanzani and others had, before him, excited the discharge of the gastric juice by the introduction of such inert substances as sponge, tubes, pebbles, etc., into the stomach *per os*. I do not see therefore how we can possibly accept Pawlow's generalization that the human stomach is not stimulated to secrete juice by mechanical irritation. There is a difference between man and his more highly organized nervous system and the dog. The human stomach is the more sensitive. Admitting this, we obtain an explanation of an apparent paradox which Pawlow points out and attempts imperfectly to explain. He gives an instance from his own personal experience in which, after an illness accompanied by a transient high fever, he had lost all desire for food and had a complete indifference towards eating. Fearing collapse, on the second or the third day, he endeavoured to create an appetite by swallowing a mouthful of wine. He felt it quite distinctly pass along the œsophagus and into the stomach and literally, at that moment, perceived the onset of a strong appetite. He admits, therefore, that the tactile sensation of the stomach is, in man, sufficiently developed to be, at times, recognized by the psychical centres and, if he admits this, then it appears to me that he must go one step further and admit that, in the human being such sensation is capable of starting the reflex which leads to a secretion of the juice. So far as they go, the facts here recorded seem to establish the distinction between man and the dog. One possibility remains, namely, that St. Martin knew what was expected of him and that the flow was stimulated from the higher centres and was not a simple mechanical reflex. Beaumont never tried the effect of introducing substances when the attention was diverted, and his observations show that in the middle of the experiments when his subject had became accustomed to the procedure, the flow was often very small, only a drachm or two and that, rarely, it was completely wanting. Granting this, I cannot but think that the evidence is in favour of the human stomach recognizing the existence of a mechanical load and secreting accordingly. If this be so, I do not see that we can hope ever to obtain in man so perfect a demonstration of the different tides of the gastric juice as Pawlow obtained in the dog. But, with this exception, it seems that we must regard Pawlow's observations as very largely applicable. Beaumont, it is true, only made what we may term rudimentary observations. He did not—he could not—estimate the power of the gastric juice under different conditions. He did not make sufficiently accurate observations upon the digestion of individual constitutents of the diet; if he gave eggs, it was the whole egg together with salt and generally with bread. He experimented upon an enormous number of foods, even down to soused pig's feet and apple dumpling. He gave these with coffee, bread and vegetables. But, like the later observers, he found, under ordinary conditions, that within fifteen minutes the juice was already being actively discharged, and the discharge was largely proportional to the food taken, and that emotions and "whatever depresses or disturbs the nervous system" arrest the flow. I do not see that we can fail to be convinced that the broad principles of the two orders of excitation, psychic and chemical, must be the same in all warm blooded animals. What rests with us is, to observe carefully the effects of accepting Pawlow's principles in our dieting of the individual. Thus far it may be laid down as a matter of experience that the most well-fed persons are those who feed best.

SOCIETY PROCEEDINGS

PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, Tuesday, October 13, 1903; the President, Dr. D. J. Milton Miller, in the Chair.

Dr. D. J. Milton Miller exhibited a case of abdominal tumor (sarcoma of the kidney?) and pseudo-hermaphrodism in a child of two years. The patient was in good health until December, 1902, when the mother first noticed the abdominal swelling, which steadily increased in size until it reached its present dimensions. Three months before admission to the hospital (August, 1903,) a pustular eruption had appeared on the forehead and the trunk. Judging from the character of the pigmentation and the scars, this eruption was evidently of non-specific nature. The abdomen is now greatly distended, the increase in size having been very rapid during the last few weeks. The superficial abdominal veins are very prominent, and a small amount of fluid is present in the peritoneal cavity.

Palpation revealed a large, solid, globular mass, filling the right side of the abdomen and extending from the costal border to the iliac crest; it arose from the right renal region and was regarded as the kidney. The liver is enlarged and pushed to the left, with its lower border on a level with the umbilicus. This enlargement is of recent origin, as it was not noticed on admission. The spleen, which in August was three fingers' breadths below the costal border, is now well below the navel. The child presents an interesting condition of the genitals. The labia majora are much hypertrophied and sparsely covered with coarse hairs. The labia minora are also hypertrophied, and project from the vulvar cleft. The clitoris is enormously enlarged, and presents the appearance of a short but well-developed penis, being about one inch long and of the thickness of the male organ of a boy of the same age. The foreskin may be fully retracted, exposing a well-developed glans, behind the corona of which is an accumulation of smegma. There is no meatus. The remaining external genitals are those of a normal female. The urethra is situated in the vestibule, and at the vaginal outlet there is a bulging hymen. Probes introduced into the urethral and vaginal openings could not be approximated. On catheterizing the urethra, urine flowed freely. Neither testicles nor ovaries could be detected in the hypertrophied labia; nor could the uterus be palpated by rectal examination. With the exception of the vulvar hair, there are no signs of precocious puberty.

The urine contained small amounts of albumin, epithelial cells, and leukocytes; but at no time did it contain blood. On admission there were 5,650,000 erythrocytes, 15,000 leukocytes, and 75 per cent. of hemoglobin. The differential count was untrustworthy. Subsequent counts have not differed materially from the foregoing. The large number of red cells was probably due to the cyanotic condition of the extremities that has been more or less constantly present. The child has improved very much while in the hospital, and the general condition is now good.

Dr. Miller said that all that had seen the patient, including most of the hospital staff, regard the case as one of sarcoma of the kidney; although it has almost reached the usual limit of life of such cases. The enlargement of the liver and the spleen is probably due to secondary involvement of these organs, although it is quite possible that they are merely coincidental. Such enlargements, especially of the spleen, are not uncommon in cachectic states in children.

As to the genital condition, this case, Dr. Miller said, seems to be one merely of hypertrophied clitoris. The external genitals are otherwise quite normal. As to the condition of the internal sexual organs, whether one or the other is absent or is functionally inactive, can be determined only as the child grows older.

Dr. Jopson said that he had had several opportunities to see the case since its admission into the Children's Hospital. When it entered that institution, the growth in the abdomen was apparently chiefly a tumor of the kidney, and was then thought to be a sarcoma. Since that time the liver and the spleen have both grown greatly; but Dr. Jopson still believes that the condition is sarcoma of the kidney, and that the increase in the size of the liver and the spleen is due to metastasis to these organs.

Dr. Bernd mentioned a case that had been seen several times at the Polyclinic Hospital a year before, in which there was a large mass in the region of the left kidney that was evidently increasing in size. This led to a diagnosis of sarcoma of the kidney; but a post-mortem examination showed the mass to be tuberculous. It was composed chiefly of the thickened omentum, which was rolled up upon itself. There was no sarcoma.

Dr. H. B. Carpenter exhibited a patient with bilateral stenosis of Steno's duct. He was eleven months old, and was seen on September 1, 1903, with a well-marked case of scurvy. Two months ago the mother noticed a slight swelling of the cheeks; and the day he was exhibited one could see, externally and on inspecting the inside of the mouth, cystic swellings, about the size of a large almond. These were considered to be swellings of Steno's duct, probably produced by an obstruction of the opening of the duct by the stomatitis, with which the boy has suffered.

Dr. Jopson said that he had seen the patient at Dr. Carpenter's office, and that the conditions had become more marked since that time. The case is, he thought, a very unusual one. It is difficult to find any other explanation for it than that given by Dr. Carpenter.

Dr. Eshner asked whether there was any evidence of calculus.

Dr. Carpenter replied that none could be found.

Dr. Carpenter also exhibited a child with interesting heart signs. The patient was a girl eight years old. She had been healthy until the age of two years, when she had an attack of diarrhea. After this she remained well until her fourth year, when she had scarlet fever, and since then she has had rheumatism. Eighteen months ago, the mother noticed that the child was short of breath, and that her lips and nails were blue. She now has a severe cough, and there is visible pulsation from the clavicles to the sixth interspace, and almost from one axilla to the other. The apex is in the sixth interspace, nipple line. Dulness extends one inch outside the nipple line on the left side, and almost to the nipple line on the right. There is a very loud diastolic murmur at the aortic cartilage and a faint systolic murmur. There is also a systolic murmur at the apex, transmitted to the back, and a presystolic murmur is heard to the right of the sternum. A double murmur may be heard at the ensiform cartilage.

Dr. Eshner said that the disproportion between the marked signs and the slight symptoms is striking. The child has the physical evidences of a double aortic lesion, with mitral regurgitation and marked dilatation; yet she seems comfortable, and has little or no dyspnea and no other signs of cardiac incompetence.

Dr. J. H. McKee said that he had been impressed with the loudness of the diastolic murmur. This murmur is apparently due to aortic regurgitation; yet it is extremely loud, and is heard with the utmost ease. Aortic regurgitant murmurs are likely to be very soft and are often heard with difficulty. Usually the absence of the valvular click at the aortic cartilage leads one to search for them. Dr. McKee asked whether the child exhibited any vascular signs of aortic regurgitation.

Dr. Miller asked whether Dr. Carpenter would state his own views as to the diagnosis of the heart lesion.

Dr. Carpenter replied that he considered the child to have double aortic and double mitral disease, and—at times, at least—to be subject to tricuspid regurgitation.

Dr. I. Valentine Levi read a paper on Congenital Dilatation of the Colon. He said that little is known of the nature of this condition, its pathology in most cases being obscure. Various theories have been advanced, and they materially differ. Treatment is only palliative, as the condition is considered incurable, although a cure after operation has been reported. The case reported by Dr. Levi is as follows:—The patient, P. J., is a boy, four years of age. He was breast-fed for a few months, and then received condensed milk. He had pertussis at the age of four months, followed by enlargement of the abdomen and constipation. When seen there was no vomiting. The appetite was good, and there was no sign of rickets. The abdomen at the level of the umbilicus measured 26½ inches. The patient remained under observation for 14 months. The principal points in the case were: (1) Enlargement of the abdomen; (2) obstinate constipation; (3) diatasis of the recti; (4) tympany, at times replaced by dulness; (5) dilatation and downward displacement of the stomach and the transverse colon; (6) visible peristalsis; (7) emaciation. The patient improved considerably under treatment, which was directed to building up the muscular tone of the intestine and overcoming constipation. Electricity, strychnine, eserin, and normal salt enemas were employed. The movable dulness was explained by fecal impaction and the motility of the intestines. It was suggested that the lessening of the intra-abdominal pressure, due to the separation of the recti (which was also probably congenital), combined with the constipation (which is very common in children, especially in those that are artificially fed), might account for the dilatation of the colon.

Dr. McKee asked whether, as is often the case in this condition, the periods of constipation had been followed by the expulsion of foul, liquid stools. He also asked whether any rectal examination under anesthesia had been made. He drew attention to the fact that in conditions of this kind, stenosis of the rectum has been found in some instances, and that this has apparently explained the occurrence of dilatation of the colon. Dr. McKee did not feel convinced that cases with an evident anatomical lesion, such as rectal stenosis, should be considered to belong to a class separate from those in which no distinct lesion can be found.

Dr. Edsall mentioned a case that he had exhibited to the society several years before, the child having been observed in St. Christopher's Hospital. She was admitted with an enormous distention of the abdomen, evidently due to dilatation of the bowel. After the bowel had been thoroughly cleared out with an enema and some subsidence of the distention had taken place, it could be determined by inflation per rectum that the sigmoid described a wide, sweeping curve, running over to the right iliac fossa, and then making a sharp turn toward the left side of the pelvis. In that case this anomalous extent and course of the bowel had apparently been the cause of the dilatation; for at the point at which the bowel made the sharp turn feces collected whenever there was a tendency to constipation, and caused the upper arm of the bowel-loop to sag upon the lower arm of the loop, thus producing practically a stenosis of the bowel. This had been going on for several years, without any adequate relief; but, after the continued use of high enemata, keeping the bowel thoroughly washed out, and administering strychnine in large doses, to increase the tone of the intestinal musculature and of the muscles of the abdominal wall, the dilatation of the colon subsided so rapidly that at the end of about a month the child's abdomen was only slightly distended. After this time, occasional flushings of the colon and the constant controlling of constipation resulted in an entire cure, as long as the case was followed, which was for about a year.

Shortly after this case had been reported, Göppert contributed an extensive discussion of dilatation of the colon in early childhood, making an especial point of an anomalous course of the sigmoid as the cause of the condition. As Dr. Levi had mentioned that his case had exhibited decided enteroptosis, Dr. Edsall asked Dr. Levi whether he did not consider it possible that the anomalous position of the bowel had been active in causing the condition. Dr. Edsall thought this condition to be especially worth looking for; because, as demonstrated by the case mentioned by him, it is sometimes subject to such control that the patient may be practically cured. Dr. Edsall had observed a number of cases, in children and in adults, in which, he felt confident, occasional attacks of prolonged and obstinate constipation, sometimes associated with a great deal of temporary distension, were due to this condition.

Dr. Levi, in reply to Dr. McKee, said that the child had at times passed many loose and foul stools after attacks of constipation. He had not made a digital examination of the rectum. He thought, however, that there was no rectal stenosis, because a large rectal tube could be passed high into the rectum with the utmost readiness. The child undoubtedly exhibited marked enteroptosis; but Dr. Levi could not state whether the condition mentioned by Dr. Edsall was present or not, or whether it had had anything to do with the production of the dilatation.

Dr. John H. Jopson reported a case of subdiaphragmatic abscess in a male infant fifteen months old. The etiology was unknown. The child had recently been treated for bronchitis and indigestion. When first seen by Dr. Jopson, the abscess had already burrowed through the diaphragm, the pleura, and the intercostal muscles of the ninth intercostal space in the axillary line. It presented a large swelling in this region, due to a secondary collection outside the chest-wall. The nature of the abscess was not suspected until it had been opened and the primary abscess had been discovered by the exploring finger. The patient recovered under simple drainage, rib-resection not being necessary. The pleural cavity was not infected. An analysis of the statistics in Maydle's article on subphrenic abscess showed 5.9 per cent. of cases in children under fifteen years of age, but a study of 68 cases reported since the appearance of that article gave a higher percentage of children. The affection is, however, proportionately less common in children. Children are susceptible to nearly all the lesions that cause subphrenic abscess in adults; but, while in the latter, lesions of the stomach and the duodenum are the most common cause, appendicitis is the most frequent cause in early life. The prognosis without operation is bad; with operation, it is fairly good. It is better in children than in adults; this is mainly owing to the difference in the etiology.

EDITORIAL

THE SCARLET FEVER ORGANISM.

The Boston laboratories seem to be prolific in new germs. It is not many months since an animal parasite was claimed to have been discovered by Councilmann in the skin of small-pox patients, and which was held by this observer to be the cause of this disease.

From practically the same laboratory but under the tutelary endorsement of Dr. Mallory, we have the announcement that scarlet fever is also a disease of animal causation and that the protozoön, *Cyclastis scarletinalis,* Mallory, is the name by which he shall be known.

We most earnestly hope that *Cyclastis* is the cause, and that the demonstration of its specificity may be more convincing than that of the organism of small-pox.

Cyclastis scarletinalis Mallory is a very small organism; it was found in four patients, lying in the lymph spaces and in the epithelium cells of the corium lying close to the epidermis; a layer of the skin, be it borne in mind, that is comparatively rich in active chromatin substances and nuclear changes. Two forms are described in Dr. Mallory's preliminary communication, a radiated rosette and a knotted reticulum, not unlike that of the nuclei of certain animal cells. The life history seems complicated and is as yet incompletely analyzed.

Dr. Mallory believes this to be the true causative agent in the scarlet fever, but admits that the proof is by no means complete. Culture experiments, injection and transmission experiments are still wanting to make the observations approach near the bounds of the probable, but the hope may be expressed that something has been found in these patients, not hitherto known and not found in other patients in good health, or suffering from an infectious disease.

A DYSENTERY ANTITOXIN.

Since Shiga first called the attention of the medical world to his *Bacillus dysenteriae* as the most important micro-organism in the etiology of dysentery, investigators have not been wanting who have attempted to make a curative serum.

The recent work of Kruse in Germany, of Flexner in the United States and a number of others, has resulted in the production of several sorts of protective bodies, some of which have shown reassuring results.

The lack of uniformity in the findings of a number of observers has widened the horizon very considerably, and we are passing through a transition stage, not only concerning our beliefs in the matter of etiology, but also in the efficacy of a serum made from an organism or organisms whose relationships to dysentery are by no means fundamentally determined.

One of the most recent contributions to this much-to-be-enlightened subject is from the senior assistant bacteriologist of the Lister Institute, Dr. Charles Todd. He has prepared a serum from a special series of organisms and which possesses, he believes, marked antitoxic power; a serum which, therefore, is distinct from the bacteriolytic sera given the world by both Shiga and Kruse.

This new antitoxic serum is stable and in animals showed a marked grade of efficiency. Dr. Todd concludes his communication by saying that (1) by growing the dysentery bacillus in a somewhat highly alkaline broth a soluble toxin is obtained; (2) certain animals, namely, the horse and rabbit, are highly susceptible to this toxin; (3) the toxin is fairly stable and though destroyed by an exposure to a temperature of 80° C. for an hour, is not destroyed by an exposure to a temperature of 70° C. for the same period; (4) when injected into suitable animals, for example, the horse, the toxin gives rise to a powerful antitoxin; (5) the combination of the toxin and antitoxin *in vitro* does not take place immediately, but requires a certain time, and the rate of combination varies with the temperature.

Practical tests are now being made in the sick wards with this new antitoxic serum, and we can only hope that these experiences will fulfill the promise of the author's preliminary report.

ABSTRACTS

Urotropin in the Prophylaxis of Scarlatinal Nephritis.—J. Widowitz (*Wiener klinische Wochenschrift,* Oct. 1, 1903): The beneficial action of Urotropin in vesical catarrh, pyelitis and phosphaturia recorded by so many authors and ascribed to the disinfectant action of the formalin separated from it in the urinary passages, induced him to use Urotropin in scarlatina to prevent the advent of nephritis. For it is probably correctly assumed that the latter is due to the as yet undetermined scarlatinal microbe or its toxines; and an efficient antibacterial agent applied to the site of the infection may inhibit the pathological changes that mark the renal affection.

During the past three years he used it in 102 cases. From ¾ to 7½ grains were given thrice daily for three consecutive days at the onset of the disease; and the same doses were given at the beginning of the third week when nephritis most commonly occurs. Children from 1 to 15 and an adult of 21 were treated in this way. The remedy was always well borne. He has not seen nephritis occur in a single case, although it is the most common complication of scarlatina. Johannessen has seen it in as few as 16 per cent. and as many as 90 per cent. of the patients. It occurs especially in mild cases, which were the most frequent.

Two cases deserve especial mention. A girl of 11 sickened with a fairly mild attack. On the 15th day large quantities of albumin were present in the urine. Five grains Urotropin t. i. d. Two days later the albumin permanently disappeared. Another girl of 11 had had paroxysmal hemoglobinuria for 8 years. When she fell sick with scarlatina, hemoglobinuria at once appeared. Urotropin 5 gr. t. i. d. Urine free from blood coloring matter on the third day. On the 14th day, temperature rose to 100.60 and hemoglobinuria reappeared. On the 18th day Urotropin was again given, blood coloring matter disappearing 4 days later.

The absence of nephritis in his 102 cases may possibly have been accidental. But it certainly urges to further clinical trials.

Sublamine in the Treatment of Parasitic Scalp Diseases.—William S. Gottheil, New York City (*Medical News,* Oct. 17, 1903.): When sublamine was introduced as a non-irritant disinfectant equal to mercuric chloride in bactericide energy, and possessing far greater powers of tissue penetration, it at once occurred to Dr. Gottheil that the drug had a most important sphere of usefulness, not only as an external antiseptic, but also as a remedy in various parasitic dermatoses and as an antiluetic. For the toxicity, causticity and irritancy of corrosive chloride limit its use in the former and make its injection in syphilis our last resort instead of the regular treatment.

Sublamine was found by Kroenig, Blumberg, Schenck, Zaufal, Paul, Sarwey and others to possess the same bactericide power as the bichloride, but to be so non-irritant than even 2 per cent. solutions can be employed if required, and to have a far greater penetration than the older drug, as it does not coagulate albumen.

During the winter of 1901-2 a ringworm epidemic broke out in a large orphan asylum to which Dr. Gottheil and Dr. George H. Fox were dermatological consultants. The matter was brought to their attention only when the epidemic had assumed alarming proportions. Some 450 out of the 900 children were affected. Many, of course, had only a light form, but there was a large proportion of deep infection and kerion.

The serious nature of such a state of affairs is well known. Ringworm of the scalp is not, ordinarily, a grave affection; but even under the most favorable circumstances and with the most careful treatment it lasts for months. In public practice the majority of cases are not cured at all. They go from clinic to clinic, getting now a little better and now a little worse, until puberty is reached and the malady cures itself. Meanwhile these children are excluded from school and grow up in the streets. A similar epidemic in the institution some years before had nearly led to its permanent closure.

The diagnosis was confirmed by microscopic examinations and cultures, and a laboratory was organized for both methods and the control of results. Proper isolation was enforced, and observation wards were instituted in which apparently cured patients were kept for three weeks after treatment was ceased. No case was discharged until cure had been repeatedly proved. All other necessary sanitary and therapeutic arrangements were made. One hundred and fifty of the infected girls were transferred to Dr. Gottheil's skin service at Lebanon Hospital.

The patients were divided into squads. Every head was closely shaved once a week as soon as the inflammation had subsided sufficiently to permit it. Twice daily each head was thoroughly scrubbed with brush, green soap and hot water.

The remedies employed were chrysarobin, formalin, croton oil, bichloride of mercury, carbolic acid, iodine, and ethylenediamine—citrate of mercury and sublamine in various strengths.

A most determined effort was made to have proper records kept; for here was a chance to determine by comparative tests which plan of treatment gave the best results. Dr. Gottheil was not successful in this, however. Lack of discipline and the fact that often the names of the children were unknown or imperfectly known, or interchanged, helped to create confusion. The patients were scattered in four buildings and at least a dozen wards. Lack of room necessitated incessant transfers of well and sick children. Changes in staff and servants further complicated matters. Hence the records were in a very unsatisfactory state when the epidemic was ended.

Chrysarobin was soon abandoned. It was impossible to keep the children from getting it into face and eyes, and there was a good deal of trouble with dermatitis and conjunctivitis. The diffuse brown stains on the skin doubled the time required for examination. The same objection was made to iodine. This, in combination with goose grease, has lately been highly recommended by Dr. Jackson of New York, and is undoubtedly an effective preparation. The menstruum is comparatively expensive, however, for use on a large scale, and it caused coloration. At Dr. Fox's suggestion a number of cases were put upon it, but treatment was soon changed.

No definite results were obtained from salicylic acid in any form and concentration. The same is true of pure carbolic acid, followed by alcohol when too irritating. Pure formalin was used in some cases by a house physician without Dr. Gottheil's consent. It cured the patches to which it was applied, of course, but at the expense of sloughing and destruction of scalp tissue. In 10 per cent. solution, which was well borne, it did not seem to make much change in the patches.

Bichloride, sublamine and croton oil were found sufficient for all cases. The first was employed in 1:1000 solution, but many could not stand its vigorous use twice daily, and often only 1:2,000 could be used. Its effect was very slow, probably because of deficient penetration, but we persisted in its use for purposes of comparison. In most cases final recourse was taken to 33 per cent. of croton oil. This was applied several times in succession until a vigorous reaction took place. Then an ordinary soothing application (usually 33 per cent. salicylated oil) was used until the inflammation subsided, when the bichloride was again employed.

Of the two ethylenediamine-mercury compounds, sublamine was more largely used. At the time the epidemic began the citrate was the only preparation obtainable; but since the properties of the two are similar they can be considered together. They are much less irritant than bichloride. All stood 1:1,000 sublamine very well; indeed, in obstinate cases 1:750 was used without trouble. Stronger solutions than that, however, gave trouble. It is possible, of course, that the shaving and scrubbing rendered the scalps hypersensitive. But sublamine is much less obnoxious to tender or inflamed skins than bichloride and can be used in about twice the strength permissible of the latter.

Over 100 cases were treated with sublamine. As with the other drugs, they were not selected, but included cases in all stages of the affection; some had merely a single patch, whilst others were in an advanced and generalized stage of the disease. In the latter class were a number of older children who had had ringworm of the scalp for years and whom we suspected with good reason to be uncured cases from an epidemic of several years ago. They had been for months and years at Randall's Island, the city institution for orphans, and had been sent back to the asylum as cured. That this was not the case, however, is shown by the fact that some of them formed part of the contingent of chronic scalp cases that were always present in the asylum and which undoubtedly formed the nucleus of the present epidemic. Some of the cases were not cured when the epidemic ended. Dr. Gottheil believes that they belong to the small number of really incurable cases and that their retention in the institution will lead to further trouble.

All others did very well indeed under sublamine. Its action was more rapid than that of bichloride, as might be expected from the fact that with equal bactericide power it has greater penetration, and can be employed in much stronger solution. There can be no doubt that it was the most effective treatment employed.

Dr. Eckstein assisted in the microscopic and bacteriologic test for the presence of ringworm at the beginning of the epidemic. The astonishing fact was noted that a parasite indistinguishable from that of ringworm could be cultivated from scalps that were apparently perfectly healthy. The trichophyton was seemingly present on most or all the scalps, possibly in an attenuated or non-virulent form. Perhaps it was the usual form kept in depressed growth by prophylactic measures. The bacteriologic test of cure was therefore abandoned and only microscopic evidences relied upon. Cases in which repeated cultures had been made with negative results, and which were therefore discharged as cured, gave positive cultures later, though their scalps were apparently healthy.

Whole Milk in Infant-feeding.—Since 1901, Dr. Oppenheimer, in the Munich Ambulatorium, has used whole milk in the feeding of infants. In spite of the unfavorable results obtained by other observers, those obtained in Munich have been good. In generalizing from an analysis of 129 of the recent Munich cases, Eleanor Fitschen (*Archiv f. Kinderheilk., Vol.* 37, *Nos.* 1 *and* 2), gives the following rules for the use of undiluted cow's milk in the feeding of both healthy and diseased children. In the case of children that have been habituated to another method of feeding, the use of whole cow's milk should be gradually introduced. In the presence of acute gastric disease, whole milk should be excluded and should be reintroduced only after the use of diluted milk. An exception to this rule is when ass's milk is administered undiluted after the use of the so-called tea-diet. In the instances of infants suffering from acute diseases like pneumonia, it is not advisable to change the nourishment if the previous method of feeding has been well borne. Children in the first ten days of life should receive diluted milk, not because this period is considered a certain contra-indication to whole milk feeding, but because it has not yet been established that whole milk during the first few days is successful. Overfeeding should be carefully avoided. Breaking this rule results in sad, frequently fatal consequences. The following is given as an example of a successful case of feeding by this method: An infant that during the first four weeks of life, had received besides the breast-milk various forms of diluted milk, was brought to the clinic suffering from constipation. The whole milk treatment begun gradually, the child at first receiving 300 grams milk and 400 grams water in 7 feedings, at intervals of three hours. The strength of the milk was gradually increased until at the end of fifteen days, the child received 700 grams of whole milk in 7 feedings. In the weaning of breast-fed children, the following rule should be observed: By weighing the child before and after nursing, one should determine how much milk the child has taken from the breast in one day. The following day the child is given half as much cow's milk diluted with an equal quantity of water. The dilution is gradually diminished from day to day until whole milk is attained. As regards the age at which whole milk feeding is begun, there is no substantial difference between the results in children from four weeks to three months, and in children from three to six months. The results are rather better in the younger children. In infants under four weeks the results are less satisfactory.

Operation in Hip-Joint Disease Without Shortening.—The treatment of tuberculosis of the lungs and of other organs of the body has attained such satisfactory results within the last few years that the attention of ROBINSON (*Am. Med.,* Nov. 14, 1903; p. 790) has been particularly drawn to tuberculous disease of the hip-joint, especially to abscess of the hip-joint. He calls attention to two cases in which he operated, one a little girl four and a half years old, and the other a young lady, aged seventeen. The principal points to emphasize are: (1) Thoroughly clear away all diseased bone and debris. (2) Carefully preserve all existing portions of periosteum. (3) Stretch the periosteum along the track of the old bone and attach to the periosteum of the lower margin of the acetabulum. (4) Stitch the muscles and fibrous tissue over the periosteum. (5) Stretch the leg full length and apply 15 to 20 pounds weight for extension. (6) Allow the wound to heal by granulation. (7) Let the patient sit up in bed two weeks after operation. (8) Keep the weight on for four months, or use a Thomas splint, and allow the patient to be up after six weeks. (9) Do not allow the patient to walk for six months.

Acute Leucemia.—The subject of this report, by A. M. Yanoushkevich (*Prakt. Vrach*, Aug. 23, Aug. 30 and Sept. 13, 1903) began to complain of severe pain in the throat, general malaise and loss of appetite; the pain passed off in a few days, but the weakness increased rapidly, compelling the patient to give up his work. A week before admission he began to suffer from cough, dizziness, sweating and slight fever; in a few days thereafter there appeared a swelling under the upper lip, and an offensive odor from the mouth. There were no ecchymoses or petechiæ anywhere on the skin; the various glands but slightly increased in size. There were three ulcers on the reddened swollen gums. Auscultation of the arteries gives a distinct anemic murmur. The spleen is enlarged. Microscopic examination of the blood shows a marked increase in the white blood corpuscles, while the red corpuscles are of various sizes; there are also a few poikilocytes. The first count gave 52,500 white and 1,540,000 red corpuscles, and 4.86 gr. hemoglobin (Glan's method). The urine contained a trace of albumin; otherwise normal. The temperature kept gradually increasing; there occurred convulsions in the right foot, followed by convulsive twitchings of the head which lasted for two minutes. The ulcers meanwhile coalesced, forming a large, offensive, painful wound; odor from the mouth intolerable. The glands began to swell, the pulse became weaker, 156, respiration 38, condition of patient, comatose or delirious; complains of blindness, general hyperesthesia; the last count of blood corpuscles showed 165,000 white and 740,000 red (1:45), hemoglobin 2.1 gr. Patient died on the tenth day of his admission to the hospital with symptoms of severe dyspnea and cardiac weakness. The autopsy fully verified the antemortem diagnosis of leucemia; the most important alterations were as follows: Gangrene on the inner surface of the entire upper lip and part of the gums; fatty degeneration of the cardiac muscle; enlargement of various glands with hemorrhages into their tissues; lymphomata in many of the organs; enlargement of the spleen to almost double its normal size. Enlargement of the intestinal follicles as well as of Peyer's patches. Alterations in the bone marrow of the sternum and ribs, and so on. It is interesting to note in connection with this case the absence of a very important symptom of such a condition, namely hemorrhagic diathesis; the author is inclined to ascribe this absence either to some special individual characteristic of the patient's system.

INDEX TO VOLUME XV. 1903

Abscess, Liver, in Child Aged Two and a Half Years...... 123
Abscess of Lung.............. 423
Achondroplasia 34, 184
Addison's Disease, with Integrity of the Suprarenal Capsules 509
Adenoid Operation; Is It Justifiable? 502
Adenoids, Effects and Treatment of..................... 670
Adenoids and Their Treatment. 324
Adenoids and Trachoma........ 191
Adenoids with Malaria......... 494
Air, Fresh, in Children's Diseases 385
Alkaloids of Ipecac........... 120
Albumin, Passage Through the Placenta 109
Amaurosis 348
Aneurism, Popliteal, in Young Boy 526
Aneurism of Aorta in Boy.... 504
Aneurism of Arch of Aorta in Small Boy.................. 575
Anomalies of Revaccination... 317
Anti-Diphtheritic Serum, Intravenous Administration of. 117
Anti-Diphtherine in Diphtheria 574
Antipyresis 4, 254
Antistreptococcic Serum for Scarlet Fever................ 56
Antistreptococcus Serum in Severe Cases of Scarlet Fever. Preliminary Note on the Employment of................. 114
Antistreptococcus Serum, Cure for Erysipelas in Young Infant 52
Aphasia 488
Arthetosis 481
Arthritis, Pneumococcic....... 349
Arthritits, Short Humerus..... 153
Arthritis and Typhoid Osteomyelitis 315
Artificial Feeding of Infants... 528
Auscultation, Abdominal, in Infancy 426
Bacillus Dysenteriæ........... 255
Banti's Disease with Diffuse Productive Nephritis........ 320
Barbour, P. F., M. D.......... 397
Baths, Public Swimming, Micro-organisms in.............. 133
Black, J. F., M. D............. 526
Blood in Measles and Scarlet Fever 440

BOOK REVIEWS.

Diphtheria 256
International Clinics........... 511
Klinische Vorlesungen über Kinderkrankheiten 511
The Perverts.................. 384

Bow Legs and Knock-Knee... 571
Breast Feeding from an Obstetrician's Point of View.... 508
Broncho-Pneumonia, Infectious, Diphtheria Antitoxin in 499
Broncho-Pneumonis, Infectious, Diphtheria Antitoxin in..... 505
Bromoform Poisoning......... 505
Bromipin, Uses and Action of. 498
Brown, C. W. M., M. D.,...... 657

Calomel in Pediatrics......... 255
Carcinoma, Colloid............ 478
Cardiopathy, Infantile, Rare Forms of 445
Carditis 553
Carditis of Children, Opium in the 577
Care of Frail Children, Summer, ... 637
Cerebral Hemiplegia, Infantile, Paradoxical, Pseudo-Hypertrophy Following............ 55
Cervical Glands............... 553
Cesarean Section, Two Cases of 144
Cholera Infantum, Treatment of 676
Chondrodystrophv Totalis..... 428
Chorea 487
Chorea Pathology and Treatment of 618, 696
Chronic Joint Disease......... 116
Clark, L. P., M. D.,........... 142
Clavicles, Congenital Absence of 576
Cleft Palate, Age for Operating in 697

Coxitis, Tuberculous, Ultimate Results of Operations...... 170
Cod Liver Oil, Carbonated.... 170
Colic, Infantile, ... 588
Congenital Ectopia of the Kidney 62
Constipation 21
Constipation in Infants and Young Children............. 593
Constitutio Lymphatica, the Anesthetic for Children........ 166
Convulsions. Control of Fever and 521
Convulsions, Infantile........ 699
Convulsions. Non-Epileptic, in Growing Children........... 309
Convulsions. Reflex. in Growing Boys and Girls......... 253
Cow's Milk Kumyss as a Nutrient in Disease.............. 568
Crede's Prophylactic Treatment of Ophthalmia Neonatorum.. 124
Creosotal in Croup............ 121
Croup, Creosotal in........... 121
Cumston, Charles Greene, M.D., 1
Cydastis Scarletinalis 753
Death, Sudden.............121, 305
Death in Diphtheria, Causes of 65
Decker, G. E., M. D.,......... 528
Deformities, Congenital....... 362
Deformities Due to Muscular Paralysis 636
DeJarnette, H. M., M. D....... 670
Dextocardia 360
Diabetes, Acute, in Child Three Years of Age............... 54
Diabetes Mellitus, Infantile... 305
Diagnosis of Infantile Eclampsia 476
Diapers, Effects of Tight..... 172
Diarrhea, Summer, ...118, 255
Diarrheas, Summer, Leucocyte Count in.................... 60
Dickson, J. F., M. D.......... 324
Dimpling of Skin, Excessive... 347
Diphtheretic Gangrene........ 634
Diphtheria, A Contribution to the Natural History of....... 193
Diphtheria, A Review of Recent Literature on........... 641
Diphtheria, Autopsy........... 480
Diphtheria, Causes of Death in. 65
Diphtheria, Endocarditis Following 472
Diphtheria, Infection, Mixed.. 442
Diphtheria, Intubation in...... 164
Diphtheria, Laryngeal, Conclusions from 51 Fatal Intubated Cases 664
Diphtheria, Laryngeal......... 332
Diphtheria, Prophylactic Treatment of..................... 164
Diphtheria, Treatment of Intravenous Injections of Antitoxin 367
Diphtheria Bacilli, New Stain for 63
Diphtheria Bacillus, Studies Regarding Morphology of..... 532
Diphtheria Serum, A New.... 60
Diphtheria of the Ear, Diphtheritic Gangrene in.......... 634
Diplegia, Cerebral, With a History of Asphyxia Neoatorum 178
Diseases Due to Faulty Nutrition 449
Disinfection, Hand, Sublamin in 116
Dislocation, Acquired, of Hip. 63
Dislocation, Congenital, of Shoulder 150
Dislocation, Congenital, of Hip 698
Dislocation of Hip, Bloodless Treatment of................ 635
Dislocation of Frontal Bone in Parturition 321
Diuretics, Saline............... 114
Double Mitral Stenosis........ 39
Drugs? What Value Are...... 456
Ductus Botalli, Persistent.... 445
Dyspnea, Nasal Intubation for Relief of..................... 431
Dystrophies, Muscular......... 288

Ear and Throat, Post-Diphtheritic Paralysis Affecting the.. 213
Earp, S. E., M. D.,........... 390
Eclampsia, Diagnosis of Infantile 476
Ectopia of the Kidney, Congenital 62
Eczema 306
Edebohl's Operation........... 419
Edema, Epidemic, in Infants... 113
Edema of the Glottis......... 300

EDITORIALS.

Salutatory 49
Formaldehyde in Bacterial Infections 49
Antistreptococcus Serum in Scarlet Fever................ 105
Substitution 106

Castration and Masturbation... 155
Paratyphoid Infections........ 156
Infancy and Typhoid Fever... 251
School Aid for the Defectives.. 252
The Biological Control of Smallpox Vaccine 303
The Diphtheria Bacillus and the Bacillus of Hofmann........ 363
The Cause of Small-Pox...... 365
Economy in New York State Charities 433
The American Pediatric Society 434
Dysentery in New York........ 490
Teething and Fever............ 491
Another Lost Illusion......... 565
The Hot-Water Bottle and the Newly Born 566
Chorea 628
The Operative Treatment of Chronic Bright's Disease.... 629
Children's Diseases in Large Cities 683
Milk Supply and Children's Diseases 684
Scarlet Fever Organism........ 753
Dysentery Antitoxin 754
Empyema 126
Endarteritis and Nephritis, Syphilitic 236
Endocarditis 564
Endocarditis Following Diphtheria 472
Enemas of Bromipin.......... 496
Enuresis, The Therapy of....62, 612
Epilepsy Treatment by Bromides, Salt Starvation Principle in...................... 142
Epiphysitis 690
Epispadias 691
Erysipelas in a Young Infant Cured with Antistreptococcus Serum 52
Eye Influence of Heredity on the 693
Eye Lesions, Itrol and Cuprocitrol in..................... 120
Eyes of School Children, Care of 253
Eyestrain 306
Febrile Whooping Cough..... 494
Feeble-Minded, Treatment of.. 159
Feeding, Artificial 528
Feeding, Artificial, Resumé of the More Recent Advances in 125
Feeding of Infants and Children 169
Feeding Rachitic Children, Mode of.................... 502
Felt, C. L.................... 213
Femur, Fracture in Shaft.... 542
Fenton, W. J., M. D.,.......... 593
Ferment, Fat-Splitting, in Stomach 52
Fever and Convulsions, Control of 521
Fibrous Obstrution............ 636
Foods, Influence on Gastric Secretion 52
Formaldehyde, Failure in Septicemia 191
Formalin in Septicemia....... 169
Formalin in Whooping Cough. 443
"Fourth Disease" 171
Fourteenth International Medical Congress................ 287
Fracture in Shaft of Femur... 542
Frail Children, Summer Care of 637
Friedlander, Alfred, M.D........ 513
Frontal Bone, Deep Depression in New Born Relieved by Operation 181
Frontal Bone, Dislocation of.. 321
Gastric Secretion, Influence of Foods on.................... 52
Gastro-Enteritis, Acute, Treatment of 673
Gelatin, Subcutaneous Injections 696
Glands, Cervical. 553
Glands, Cervical and Mediastinal, Enlargement of......... 293
Glottis, Edema of............. 300
Glynn, E. E., M. D.,......... 133
Goiter, Congenital.........493, 501
Gonorrhea 306
Greanelle, Wm. J., M. D.,...... 70
Growth, Periods of............ 288
Hastings, R. W., M. D.,........ 385
Hamill, S. McC.,.............. 257
Health, School Life in Relation to 462
Heart Disease, Congenital..175, 240
Heart Disease, Congenital in Six Members of a Family... 367
Heart Disease, Congenital, with Eye Findings................ 257
Hemophilia, Joint Affections in 440
Hip, Acquired Dislocation of.. ....63, 698, 759
Hip Joints at Home and Abroad 183
Histology of the Small-Pox Lesion 111
Hospitals, Children's........... 552
Howard, W. L.................. 274
Humerus, Short, Arthritis..... 153
Hydrophobia 691, 692
Hypertrophy, Tonsillar........ 169

Ichthyosis Hystrix............. 360
Imbecility, Mongolian......... 393
Indigestion, Chronic Intestinal. 43
Idiocy, Amaurotic Family..... 8
Illoway, H.................... 193
Infants, Epidemic Edema in... 113
Infant Feeding..........277, 689, 758
Infant Feeding, Percentage, An Easy Method of............. 657
Infant Feeding, Percentage, Modification of Milk in..... 700
Infant Feeding as Based on the Evolution of Mammals...... 426
Infantilism 347, 482
Infections of the New-Born.... 423
Influenza 695
Injections of Gelatine, Subcutaneous 696
Intestines, Foreign Bodies in the 417
Intestine, Foreign Body in..... 44
Intravenous Administration of Anti-Diphtheritic Serum..... 117
Ipecac, Alkaloids of........... 120
Itrol and Cuprocitrol in Eye Lesions 120

Joint Disease, Chronic........ 116
Jones, Robert, M. D.......... 77
Jump, H. D., M. D............ 472

Keratitis, Interstitial.......... 478
Kerr, C. B., M. D............ 641
Kidney, Congenital Ectopia of the 62
Kohn, Bernard, M. D......... 65
Kumyss, Cow's Milk, A Nutrient in Disease............... 568

Laird, Arthur F., M. D........ 532
Laryngeal Diphtheria.......... 332
Laryngeal Diphtheria, Conclusions from 51 Intubated Fatal Cases 664
Laryngeal Stridor 692
Leavitt, F., M. D............. 456
Lesions, Arterial, in Rheumatismal Infection, Contribution to the Study of................. 160
Lesions, Renal, Synopsis of... 418
Leucemia 700
Leucocyte Count in New-Born, Differential 440
Leucocyte Count in Summer Diarrheas 60
Lichen Spinulosus............ 503
Long, Thomas J., M. D....... 521
Lorenz, Adolph, Address of... 92
Lorenz, Adolph, Reception Given to 92
Lorenz Cases and Other Hip Cases, Discussion of......... 151
Lumbar Puncture and Its Value, Especially in Cases of Meningitis 71

McAllister, Alexander, M. D... 588
McCurdy, Le Roy, M. D....... 321
McCassy, J. H., M. D......... 462
McNaughton, G............... 263
Mania in Child................ 348
Marasmus 397
Marasmus, Relation of Thyroid Gland to 697
Masturbation in the Young Girl 274
Measles in New-Born......... 357
Measles and Scarlet Fever, Blood in..................... 440
Meningitis, Lumbar Puncture and Its Value in............ 71
Meningitis 553
Meningitis, Treated by Lumbar Puncture 34
Meningitis, Tuberculosis, Pertussis and 358
Meningomyeloencephalitis, Paralysis Resulting from........ 506
Mewborn, A. D.............. 220
Micro-organisms in Public Swimming Baths............ 133
Milk, Fat and Total Solids in.. 425
Milk, Human, for Infants..... 288
Milk, Breast: Cow's as Affected by Alkalies and other Antacids 688
Milk, Cow's, Raw in Infant Feeding 277
Milk, Influence of Preservatives upon the Food Value.. 54
Milk Kumyss, Cow's, A Nutrient in Disease............... 568
Milk, Percentage Modification in Infant Feeding........... 700
Milk, Raw and Formaldehyde, Detection of................ 495
Milk, Simple Method of Examining 44
Milk, The Ferments of........ 503
Milk Commission, Report on the 554
Milk Mixtures, Clinical Analysis of 424
Milk Percentages...........555, 758
Mitral Disease 553
Mitral Obstruction............ 487
Mitral Stenosis 39, 469
Monoplegia, Brachial, Occurring in the Course of Chorea 162
Morphine Poisoning 633

Morphology of Diphtheria Bacillus 532
Morrison, Alexander, M. D.... 577
Mouth Organ, Tin.......... 552
Myotonia of Infancy, Tetany and 59
Myxedema 428
Neonatorum, Ophthalmia, Crede's Prophylactic, Treatment of 124
Nephritis, Chronic Interstitial. 695
Nephritis, Diffuse Production in Banti's Disease 320
Nephritis 553
Nephritis and Endarteritis, Syphilitic 236
Nephritis in Four-Year-Old Boy Having Only One Kidney 418
Nervousness, Training to Prevent 177
Neurasthenia 305
Neuritis, Peripheral 162
New-Born, Acute Pyogenic Infection in 44
New-Born, Infections of....... 423
New-Born, Resuscitation of.... 313
Nutrition, Faulty, Diseases Due to 449
Nystagmus (Hereditary), Congenital 70
O'Dwyer Intubation Instruments 431
Obstruction, Complete Fibrous, of Venæ Cavæ.......... 636
Obstruction, Mitral.......... 487
Ophthalmia Neonatorum 287
Ophthalmia Neonatorum, Crede's Prophylactic Treatment of.......... 124
Opium in the Carditis of Children 577
Orbital Wall, Temporary Resection of the.......... 441
Osteo-Arthopathy 429
Osteomyelitis, Surgical Treatment of 1
Oxygen in Diphtheric Stenosis 444

Paralysis Affecting the Ear and Throat, Post-Diphtheritic.... 213
Paralysis Affecting the General Nervous System, Post-Diphtheritic 202
Paralysis, Birth, of the Upper Extremity 310
Paralysis, Certain Principles and Methods in the Surgery of 253
Paralysis of the Shoulder, Intile Obstetrical 185
Paralysis, Infantile, Epidemic of 56
Paralysis, Juvenile General 161
Paralysis, Muscular, Deformities Due to.......... 636
Paralysis, Post-Diphtheritic ... 249
Paralysis, Post-Diphtheritic Ocular 217
Paralysis, Spastic, Treatment of Infantile 77
Paraplegia, Spastic, and Operation 357
Parotitis, Epidemic, With Metastasis to the Female Genitalia 263
Peliosis Rheumatica 119
Peliosis Rheumatica, Brief Review of Literature.......... 36
Peribronchitis and Interstitial Pneumonia 89
Pericardium, Adherent 35
Periostitis, Multiple Ossifying. 295
Peritonitis, Pneumococcus 306
Peritonitis, Tuberculous, Diagnosis of 507
Peritonitis, Tuberculous, Prognosis of 188
Peritonitis and Obstruction... 485
Peritonitis from Vulvo-Vaginitis 53
Perkins, J. B., M. D.......... 542
Pertussis and the Early Blood-Findings 439
Pertussis and Tuberculous Meningitis 358
Peter, L. C.......... 202
Phosphaturia 444
Placenta, Passage of Albumin Through 109
Plasmon, Chemical and Physiological Properties of......... 172
Plastic Operation for Tendon Defects 171
Pneumonia, Croupous, Absence of Knee-Jerk in 382
Pneumonia, Interstitial, Peribronchitis and 89
Pneumonia, Report of Eight Cases, Treated With Antipneumococcic Serum 427
Poisoning, Infant, A Possible Case of.......... 691
Poisoning, Morphine 633
Poisoning by Wintergreen Oil 488
Polyarthritis, Two Cases...... 640
Polyarthritis, Still's Type of Chronic Deforming 431
Popliteal Aneurism in a Young Boy 526
Pott's Disease 410

Pregnancy in Phthisical Workingwomen, Necessity for Interruption 109
Preservatives, Influence Upon the Food Value of Milk.... 54
President's Address American Pediatric Society 418
Pseudo-Hypertrophy, Paradoxical, Following Infantile Cerebal Hemiplegia 55
Puncture, Lumbar, for Meningitis 34
Pylorus, Congenital Gastric Spasm of the................ 430
Pyranum, Antipyretic and Anodyne 506
Quinine, To Give.............. 701
Quinsy, Early Treatment of... 184
Rachitis 483
Rachitis, Etiology of.......... 424
Rachitis, Phosphorus Treatment of 497
Rashes, Vaccine 493
Raw Milk and Formaldehyde, Detection of 495
Relapse, Scarlet Fever with... 57
Respiration, Disturbances of the New-Born 432
Resuscitation of the Newly-Born 313
Revaccination, Anomalies of.. 317
Rheumatica, Peliosis........36, 119
Rheumatism, Acute, Micrococcus of 312
Rheumatism in Childhood..... 513
Rheumatismal Infection, Contribution to the Study of Arterial Lesions............... 160
Ringworm of Face, Two of Scalp, Contracted from Microsporon of the Cat.......... 220
Rocking Chair for Weakly Children 445
Rosenthal, Edwin, M. D....... 332
Royster, L. T., M. D.......... 417
Sachs, B., M. D................ 8
Saline Diuretics............... 114
Salt Starvation Principle in Epilepsy Treatment by Bromides, Note on the.......... 142
Sarcoma, Congenital 348
Saunders, E. W., M. D......... 4
Sayre's Case, Dr., Discussion of 152
Scapula, High Position of, Defect of Trapezius and Movable Kidney.................. 507
Scarlet Fever.................. 306
Scarlet Fever, Antistreptococcic Serum for................ 56
Scarlet Fever, Antistreptococcus Serum in Severe Cases.. 114
Scarlet Fever, Blood in Measles and 440
Scarlet Fever, Microscopical Diagnosis of................. 165
Scarlet Fever, Supposed Infectivity of Desquamation...... 51
Scarlet Fever, Treatment of by a Scarlet Fever Streptococcus Serum.................. 166
Scarlet Fever, Its Complications and Sequelæ, Treatment of 694
Scarlet Fever Organism........ 753
Scarlet Fever Virus, Diffusibility of......................... 446
Scarlet Fever with Relapse.... 56
School Life in Relation to Health 462
Schools, Medical Inspection of 189, 256
Schoenlein's Disease, Fatal Case of...................... 436
Scleroderma 170
Scleroderma, Circumscribed, in a Child 496
Scurvy 360
Scurvy, Infantile 254
Septicemia, Formalin in....... 169
Serotherapy in Diphtheria..... 289
Sex, Mistaken................. 182
Sexual Perversion, Acquired... 274
Shoulder, Congenital Dislocation of...................... 150
Shurly, B. R., M. D........... 664
Sinkler, F. W., M. D.......... 469
Skin, Excessive Dimpling of.. 347
Small-Pox Lesion, Histology of 111

SOCIETY PROCEEDINGS.

American Pediatric Society.... 418
British Medical Association. Section on Pediatrics....618, 680
Brooklyn Pediatric Society.249, 673
New York Academy of Medicine, Section on Orthopedic Surgery 92, 149
New York Academy of Medicine. Section on Pediatrics..34, 44
Philadelphia Pediatric Society,..39, 89, 101, 240, 293, 350, 483, 553, 747
Society for the Study of Disease in Children...47, 236, 290, 347, 360, 478
Spasm of the Pylorus, Gastric. 430

Spastic Paralysis, Infantile, Treatment of.................. 77
Spicer, C. R., M. D........... 393
Sporadic Cretinism in Children 373
Spurious Tapeworms or Parasitism Due to Undigested Bananas 631
Stain, New, for Diphtheria Bacilli 63
Status Lymphaticus, Surgical Aspects of 167
Stenosis, Diphtheric, Oxygen in 444
Stenosis, Double Mitral......... 39
Stenosis, Mitral................ 469
Stiles, C. W., M. D............. 129
Stimulation, Clinical Value of Blood Pressure as a Guide to 447
Stomach, Fat-Splitting Ferment in 52
Studies Regarding Morphology of Diphtheria Bacillus....... 532
Sublamin in Hand Disinfection 116
Sublamin in Parasitic Skin Diseases 755
Sullivan, W. N., M. D.......... 449
Summer Care of Frail Children 637
Summer Complaints of Children 701
Surgical Treatment of Acute Osteomyelitis 1
Surmont, H., M. D............ 21
Syphilis, Hereditary, without Exanthem 438
Syphilis and Coryza in Nurslings 288
"Tachiolo" Fluoride of Silver, Antiseptic Power of......... 160
Tapeworm, Double-Pored Dog. Case of Infection with...... 129
Tebbetts, J. H., M. D.......... 410
Teeth, Extracted, Replaced.... 390
Tendon Defects, Plastic Operation for...................... 171
Testicle, Ectopic............... 484
Tetany, A New Sign of........ 53
Tetany and the Myotonia of Infancy 59
Therapy of Enuresis, The...... 612
Thigh, Fractured, Treatment of 182
Tin as a Teniafuge............ 502
Tonsillar Hypertrophy......... 169
Trachoma, Suntropical......... 689
Trachoma in the Public Schools of New York................ 192
Trapacocaine, Use of.......... 503
Treatment of Enuresis......... 62
Trichophytosis of the Scalp, An Epidemic in Schools......... 700
Tuberculides 495
Tuberculosis, Congenital....... 125
Tuberculosis, Is It Transmissible by Cow's Milk?.......... 288
Tuberculosis, Is Urban Hospital Treatment of External or Surgical, Justifiable?..... 552
Tuberculosis, Treatment of by Meat Juice 288
Typhoid Fever 163
Typhoid Fever, Cerebro-spinal Form of..................... 504
Typhoid Fever, Report of Ninety Cases................. 127
Typhoid Osteomyelitis and Arthritis 315

Urotropin in Nephritis 755
Urticaria, Treatment of........ 700

Vaccination, Insusceptibility to by Infants Whose Mothers were Vaccinated During Pregnancy 383
Vaccine, Chloroform in the Preparation of 507
Vaccine Rashes................ 493
Variola, Congenital............ 163
Virus, Diffusibility of Scarlet Fever 446
Vulvo-Vaginitis, Peritonitis from 53
Vulvo-Vaginitis, Prophylaxis in Prevention of Spread of...... 430

Wallace, A. J., M. D............ 144
Walrus Fin.................... 149
Warrington, W. B., M. D...... 71
Whooping Cough, Formalin in 441
Whooping Cough, Inhalation Treatment of................ 501
Whooping Cough Paroxysms, Treatment of................ 509
Worms, Parasitic, Why Not Digested 190

Zahorsky, John, M. D......476, 612

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